THE BUILDER

A RECORD OF ARCHITECTURE AND CONSTRUCTION.

VOL. CVIII.—No. 3759. FEBRUARY 19, 1915.

THE HUMOURS OF RESTORATION.

THE correspondence which has taken place in the daily Press on the question of the proper manner of dealing with the roof of Westminster Hall brings up once more the whole controversy as to the right method of dealing with such of our old buildings as have become, in process of time, unsafe or ruinous. Sir Aston Webb and Mr. Reginald Blomfield have given the sanction of their approval to the method proposed by Mr. Frank Baines—that is, the preservation of the existing roof by relieving it of the structural strain to which it would ordinarily be subjected; in other words, by the use of concealed iron construction which will take all strain and weight which may be put upon it. Mr. W. D. Caröe criticises this proposal on the ground that it is unnecessary and expensive in the first place, as compared with the cost of reconstructing the roof with new timber, and, secondly, on the ground that it makes the existing roof a sham which apparently is fulfilling a function it is not in reality able to do.

We imagine that there would be absolute agreement among architects that a proposal to put up a new hammer-beam roof which only served a decorative function would be fundamentally wrong, and the question is how far such a proposal is justified when the object gained is the preservation of actual work which has come down to us from past ages, and how far, if such work is replaced, it is possible to do so in such a manner as to give the same artistic satisfaction that was given by the original structure. We say artistic satisfaction, for antiquity *per se* appeals to most people and to all antiquarians and historians, and no counterfeit presentment of what was can give the same sense of satisfaction to the average man as was conveyed by the original work.

We know in former ages that in most cases work was carried out in the manner of the time, and that a building left unfinished in one age was completed in the manner not of that age but the next; but though we assume that this was done deliberately we cannot be altogether certain that had complete drawings existed showing the original designer's intentions such drawings would not have been adopted as the basis of the later design. Wren's western towers at Westminster occur to us as being, perhaps, typical of the work which would have been done instead of the Renaissance western towers of Tours Cathedral, for the generations which are dead would not have been likely to concern themselves with accuracy of detail in the way in which we concern ourselves about such matters now. Whether we should be the gainers in uniformity of conception or the losers in historical interest is difficult to say.

The vexed question of the treatment of the problem created by the collapse of the Campanile of St. Mark at Venice was an interesting one. Is it right in such a case to reconstruct on the original lines, to reconstruct at all, or to build a new campanile which should represent the best design obtainable? The original function of the Campanile no longer existed; to rebuild it at all was an anachronism, nor could it be regarded as an architectural masterpiece. Yet without it the immemorial impression of Venice was wanting, nor would a campanile designed on different lines satisfy those to whom Venice appealed as one of the most romantic and beautiful of the legacies of the past. Had it been destroyed a couple of centuries earlier we imagine it would have been replaced by such a structure as forms part of the Basilica at Vicenza, and Ruskin would have had further material for emphasising the difference between the ignoble Renaissance and the virtues of earlier work. Our immediate ancestors made short shrift of the Renaissance additions to our mediæval buildings, and we now think they were wrong; but was the evil not that they destroyed work of the past, but that they had none of the present worthier to take its place? The more we think of such problems the more difficult does it seem to solve them on reasonable lines, or to determine what reasonable lines are, because we are confused by the conflicting appeals of past and present, and are uncertain of the worth of our own work. Looking at the problem of Westminster Hall in one light, we may say that the extremely able proposals of Mr. Baines are the means of preserving an old roof like the specimen placed in a museum; in another sense it is preserving for generations yet unborn a great historical relic which we have no right to touch with sacrilegious hands. In the same way we may say that the proposal to do as Mr. Caröe suggests is to perpetuate the design of the original roof intact, and to place future generations in as favoured a position as that of our forefathers. And does it really matter whether the timbers which compose the trusses are two hundred or eight hundred years old, as long as they are to all intents and purposes identical? The alternative to either course, to construct a roof which is of this century, is not here open to us, as the age of great timber roofs may be said to be past, nor have we the confidence shown by Inigo Jones when he added his new Corinthian portico to old St. Paul's, or we might propose to cover the old hall with a coffered ceiling and treat its walls in a classical manner.

Much as has been the good done by the Society for the Preservation of Ancient Buildings, we have always felt that their suggestions involve a fallacy. We are, they tell us, to preserve carefully what is old, but if we have to repair it or partially to rebuild it we must do so in a way which makes the date of the new work evident. In other words, we are to replace what was essentially meant to convey an impression of unity with something which cannot convey that impression, because we place a value on antiquity which would have been the last thing the old builders themselves would have placed any value on. Therefore, in our care for the past, we are acting in what would in the past have been looked upon as an entirely novel method, and are, in an extreme case, converting a building into something remarkably like a chronological patchwork of dates.

It can hardly be thought that the Greeks at the time of Pericles would have repaired or enlarged the buildings of the more archaic past in accordance with the type of work done in those past ages. Had they done so the world would have been poorer by the loss of examples of Greek art in the age of its culmination. But in the era of churchwarden Gothic all restoration done in the taste of the day has become an object of regret.

There are many reasons for hoping that we shall in time have a national manner of building which will have such intrinsic merits that the demolition of the work of the past will leave us greater architecturally than we were; for in the main the question of restoration or renewal is largely determinable on the intrinsic merits of what is given *versus* what is taken away, and the generation which places the highest value on the work of past ages is likely to be that which has least of its own to give to the world. But even if this be so there will be among the educated classes, which will become larger with the passage of time, the claims of a sentimental regard for the past, not on the grounds of its intrinsic merits, but on those of feeling and association, and it will be long before such considerations cease to exercise immense weight.

In spite of democratic theories, mankind is essentially conservative, and, it may be, will always continue to be so; and it is more than possible that the greatest bar to progress consists, not in the natural difficulties of making progress, but in the limitations of habit and use which we impose on ourselves. And, as we cannot adjust our ideas by comparison with the standards obtaining in another world, we must grope on confined by self-imposed limitations, for which reason, as long as mankind is what it is, problems like those of restoration will remain in the main insoluble, but for that very reason of perennial interest and importance.

NOTES.

Schemes for the Improvement of Paris.

THE last issue of the *Journal* of the London Society contains the translation of considerable portions of the Report by M. Delannay, the Prefect of the Seine, on the future development of Paris. One of the difficulties in dealing with Paris consists in the unusual concentration of its population. It has over 370 persons per hectare (a hectare is nearly 2½ acres), as against 265 in Berlin and 161 in London. This is the average for the whole city. In the third arrondissement, where the density is greatest, there are 739 inhabitants per hectare. Every one familiar with Paris must have been struck by the close and compact manner in which even the best class of houses are crowded up; the narrow tunnel leading into a small courtyard, into which the windows of the best rooms look, while inferior apartments have to be content with such light and air they can get from a narrow shaft; and the small size of many of the rooms. A good London house, even in a street terrace, is spacious compared with a Paris house of the same class; and, of course, the extensive employment of tenements in flats tends to increase the number of inhabitants per superficial area. And M. Delannay contrasts the spacious London parks, within easy reach of the inhabited areas, with the lack of similar open spaces in Paris; for though the Bois de Boulogne and the Park at Vincennes are spacious enough, they are (except for the owners of carriages) too far out of the way for anything but an occasional Sunday excursion. Paris possesses a good many private gardens, which help to give air spaces to the city, but these, we are told, "tend to disappear," no doubt owing to the prices offered for them as building land. As the modern building laws apply only to new buildings the result is that a great deal of badly planned and often somewhat dilapidated house property is kept up by its proprietors, in order to escape the incidence of the building regulations. The only remedy for this state of things, M. Delannay thinks, would be a campaign of forcible "dispossession by areas," whereby dangerous island sites would be demolished and wide streets and airy houses substituted. He admits that archæologists may fear the destruction of interesting and picturesque buildings, but suggests that it would be possible to save the best of these, and even to show them to better advantage "by detaching them from the cankerous growth which surrounds them." The height of buildings in comparison with the width of street, in many of the old streets, is also a subject of trouble; the more modern streets of Paris are, of course, much wider than the average London street, but there are old streets where the houses are two and a half times the width of the street in height, and we do not gather that any attempt has been made to set back each new building to a future building line, so as to widen them by degrees, as is done in London in many cases. On the other hand, Paris may well boast of its street trees. Eight miles of streets have been planted with trees in London since 1885, but Paris has more than 160 miles of tree-planted streets. We note that one of the difficulties in the way of public improvements in Paris arises from the great number of small property owners who have to be dealt with. Perhaps in this respect there may be some advantage to us in the fact that the bulk of London is in the hands of a few ducal ground landlords.

Lighting Fixtures.

THE paper on this subject, read by Mr. F. W. Thorpe at the Royal Society of Arts on Tuesday, dwelt a little too much on the question of harmonising the lighting fixtures with the "period" in which the room or building was supposed to be designed. We are getting rather past that point now. We have modern methods of lighting, chiefly electrical, to consider; and the true object in designing fittings for lighting should be not to assimilate them to the style of any assumed period, but to design them so as to be artistic in themselves, and to place them so that they may distribute the light in an agreeable and convenient manner, without interfering with the general architectural design and details. We quite agree with Mr. Thorpe that this latter consideration is often left too much to haphazard. In the case of a large interior which is to be lighted by electricity, as nearly all large interiors are now, the design and placing of the lighting fixtures should be considered from the first, and form an essential part of the general architectural design. As to fixtures, the brackets or candelabra themselves, the general fault with those specially designed, especially in work done under official bodies, is a too great restlessness and elaboration of detail. Simplicity and restraint are much better elements in artistic design than florid pretentiousness. Mr. Thorpe makes the saddening remark (only too frequently true) that "lamp-posts are generally purchased by the borough engineer"; and dreadful things they generally are. He adds, "It would be desirable for the designs to be first submitted to an architect." What is the use of that when we know that really good designs cannot be purchased out of trade stock? They should be designed by an architect, with special reference to their position. How much lamp-posts can do towards vulgarising a great structure we had the opportunity of seeing some time ago, when the whole of Rennie's (or Cockerell's?) fine lamp-standards were removed wholesale by the London County Council from Waterloo Bridge, merely on the plea that one or two of them were in need of repair, and the bridge utterly spoiled by commonplace patterns being put up in their place. The old designs are happily replaced now, but only in consequence of very stringent outside criticism, in these columns and elsewhere.

Stonehenge Enclosure.

THE death of Sir Edward Antrobus, the owner of the ground on which Stonehenge is situated, recalls his enclosure of this famous prehistoric monument and the successful defence of his action when its legality was challenged in the Courts. His good intentions were not disputed, and his action may have had a beneficial effect on Stonehenge, but his death seems to provide an opportunity for reopening the question of its guardianship. Everyone agrees that such monuments should be placed under competent and responsible control, but opinions may differ as to the authority in whom that control should be vested. But even if we all agree that the private owner of land is the ideal custodian of such relics of the prehistoric life of the nation as happen to be situated within the boundaries of his estate, we may not all agree with the methods he adopts for their preservation. It may be that Stonehenge suffered such injury from gipsies, tramps, and excursionists as to justify the owner in taking steps to protect it, but that did not necessarily justify him in enclosing it. Enclosure may be the simplest and most obvious method of protection, but it does not follow that it is therefore the best one or the one most in harmony with public sentiment, which seems to be in favour of free public access to all places and objects of national interest. And, though we may grant both the justice and the expediency of refusing this access to such monuments and admit the necessity of enclosing them, we may still object to the manner in which this is done; and the manner in which Stonehenge was enclosed seems open to considerable objection. Stonehenge may be claimed as an architectural monument—primitive perhaps, but still definitely architectural. Both by character and position, as well as by age and immemorial traditions, it has an impressive dignity which is not enhanced by wire fences and wooden ticket boxes. From an architectural point of view it is perhaps doubtful whether such a primitive monument, situated on an open down, can be enclosed with advantage, but, if it must be enclosed, it should be possible to find an architectural lay-out of its surroundings that would add to, not detract from, its present impressive effect. At any rate, it would be evidence of a fitting respect for one of the most valuable records of the primitive life of the race. Should such an architectural treatment, however simple, be considered more than can be expected from any private owner, an argument seems to be created for the State ownership of all monuments of definite value and interest to the nation.

Non-Fatal Fire Inquests.

IN holding an inquiry into the circumstances attending a fire which occurred on the night of December 24 at 29, Upper Thames-street, the City Coroner drew attention to the fact that his is the only judicial court in which witnesses may be examined on oath to elicit information as to fires that do not involve loss of life or, at the outset, charges of arson. The possibility of such examination would at all times be useful as a means of assisting the police, who were officially represented at the inquiry in question; but in the present national conditions, when we are fighting with a people whose retrogression to barbarism is unfortunately so complete, it affords a means of tracing crimes of which recent German official declarations demonstrate the possibility. This fire involved large premises, occupied by Messrs. Beck & Follitzer, wharfingers and shipping agents, and Messrs. Miles, Druce, & Co., which were stated to have been insured for £23,000. Three women were rescued by special constables, who received commendation from the court, and the Fire Brigade maintained its name for promptitude by being on the spot within a minute and a half of the call. Various suggestions were made as to the cause of the outbreak, but the jury had to return a verdict that the fire originated from an unknown cause. Colonel Fox, of the London Salvage Corps, said there were no suspicious circumstances. We again draw attention to the fact that only the City of London makes proper public inquiry into cases such as this, and once more urge the desirability of extending a system which not only constitutes a valuable deterrent to criminals, but which also must in many cases put an end to unjust and very injurious rumours as to the cause of individual fires.

Etchings in Flanders.

A NUMBER of etchings of "Old Buildings in Flanders," by Mr. Marten Van der Loo (of Antwerp), are on view at the Gallery of Messrs. Goupil & Co., at 25 Bedford-street, Covent Garden (not to be confounded with the "Goupil Gallery" in Regent-street). Those who enjoy seeing powerful and artistic representations of picturesque corners of old cities will find the collection well worth a visit. Mr. Van der Loo is an artist with a very bold style and an eye for powerful effects in the opposition of light and dark masses, and for the character of ancient buildings. The drawings are not mostly concerned with large and important buildings, but with effects of old street buildings. "Vieux coin à Malines" is remarkably effective; also "Béguinage de Bruges—les Grandes Arbres," where the tree-stems rise up black against the snow background; and "Voilier dans les Bassins," a capital study of a black-and-white ship's hull in dock, perhaps the best thing in a collection which contains nothing weak or commonplace. But Flanders, interesting as it is, is well-known ground to both architects and the general public, and we should be glad to see an exhibition of sketches from the Eastern lands, which are now becoming great battle centres. Travellers move in hackneyed grooves, and it may be in the greatest of the world's cities that none could be found who had depicted on paper the historic buildings in Polish and Galician centres.

THE ordinary meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, Mr. Ernest Newton, A.R.A. (President), in the chair.

Mr. Guy Dawber (Hon. Secretary) announced the decease of the following members :—Mr. Henry Dawson, elected Associate 1859, Fellow 1869; Mr. George Herbert Burstow, Associate, elected 1910; Mr. John James Smith, Associate, elected 1882; and Mr. Frederick Robert Edwin Sladdin, Licentiate, 1912.

Presentation of Prizes.

The Chairman said the meeting would remember that, owing to the war, the annual competitions for the prizes and studentships in the gift of the Institute had been postponed. He had, however, the pleasure to make two presentations that evening—one, the Ashpitel Prize, to Mr. G. E. Francis, who had distinguished himself most highly in the Final Examinations of the year; and the other, the Pugin Medal, to Mr. William Cecil Young, who was awarded the Studentship last year, and, having fulfilled the conditions to the satisfaction of the Council, was now entitled to receive the Medal.

ARCHITECTURAL SCULPTURE IN SPAIN.

Mr. A. N. Prentice then read a paper on "Architectural Sculpture in Spain," in the course of which he said :—

"Spain is perhaps the one country in Europe where the happy intermingling of the two sister arts can be profitably studied. At all events, there are few countries which contain such a wealth of fine examples spared by the ravages of time and war. The well-preserved sharpness of existing works in stone and marble may, to a certain extent, be accounted for by the geographical situation of the country, while the profusion of decorative sculpture exhibited on the buildings may be traced to a characteristic love of display inherited from the Moors. The desire for rich detail was common to both races, with this distinction—that the Moors were content to limit their ornamentation to geometrical and natural forms, the idea of any representation of the human figure being specially repugnant to the Moslem mind.

On a first visit to Spain the architectural student already familiar with Gothic sculpture in England, France, or Italy will be astonished at the richness and voluptuousness of the work when brought face to face with many such examples. He may possibly have no previous knowledge of their existence, nor even know by whom or why they were erected. Time may also be limited, and to attempt to make a drawing is impossible. It therefore frequently happens, as in my own case, that a good photograph is secured as a substitute. Having a large collection of these interesting views, it is my present desire to put them to some practical use by making them the subject of this paper.

I may say at once that no Spanish sculptor has ever risen to the fame of a Donatello or a Michelangelo. Nevertheless, Spain produced native talent of a very high order, quite unsurpassed by any in England during the same period.

After a brief sketch of the development of architectural sculpture my remarks will be confined to the period immediately preceding that far-reaching event in Spanish history—viz., the union of the crowns of Castille and Aragon, an epoch which terminated with the close of the illustrious reign of the joint sovereigns, Ferdinand and Isabella.

The imagination of the Romanesque stonecutters lavishly displayed on monuments and in churches may be admired on the double capitals in the cloisters of Santo Domingo de Silos. They are all richly carved with Bible subjects, with beast forms, fantastic monsters, and familiar scenes from human life.

With few exceptions the new churches were of moderate size. Their type was that of the Basilica, with well-marked transepts, and occasionally at the crossing a lantern dome was added. At Toro, Zamona, and Salamanca this form of dome was further developed. It seems to have been a feature on which the Spaniards exercised their ingenuity in evolving a type peculiarly their own. Santiago Cathedral, built after the same form of plan as St. Sernin at Toulouse, was the outstanding work of the new movement. Its wonderful Puerta de la Gloria is described by Street as one of the grandest glories of Christian art. A full-size plaster reproduction of this doorway is in the South Kensington Museum.

At the church of San Vincente, at Avila, there is another beautiful portal, although one perhaps not so well known, to which additional charm is imparted by the introduction of quaint terra-cotta statuettes. The nave of this church, with its triforium and clerestory, is in the pure Romanesque style; indeed the Romanesque style lasted longer in Spain than anywhere else, and continued till as late as the fourteenth century.

In France the tremendous activity of the thirteenth-century architects soon made an impression on Spanish architecture. The grave temperament of the Castilian was sympathetic to the severe French style, and as a result the cathedrals of Leon, Toledo, and Burgos came into existence modelled on buildings such as Amiens and Reims. The creative activity of the sculptors, stimulated by studies from life, produced work which deserves to rank with the best French examples, as, for instance, the figures on the portals of Leon, Burgos, and Tarragona cathedrals.

The sculptures at Burgos Cathedral are alone sufficient to indicate the proficiency of the stonecarver's art; those in the cloisters bear trace of colour. The earlier carvings, and in particular the figure groups so happily placed at the external angles of the cloisters, belong to the opening years of the thirteenth century. Fortunately, up to the present they have not suffered from restoration. The colours are faded, but the vivid reds and blues, so much used by the Moorish decorators, can be easily seen, together with traces of gilding. The graceful ease of the later works of the fourteenth and fifteenth centuries may be studied in the door leading to the south transept. This portal is further enriched by magnificent wooden doors, executed a century and a half later by order of Bishop Acuña.

Amongst the many Flemish architects who were brought over to Spain at the end of the fifteenth century, the names of Enrique de Egas and Juan Guas stand out most prominently. Ferdinand and Isabella commissioned the latter to erect the convent church of San Juan de los Reyes, at Toledo, to commemorate the defeat of the Portuguese at Zoro in 1476, and at the same time they meant this church to be their last resting-place. The building has a very beautiful interior. It consists of a nave without aisles, but flanked with chapels. To the west of the transept the church is divided into four bays, and the Coro alto, or high choir, is placed in the last compartment, communicating by means of side galleries, with very remarkable tribunes for the Royal Family. Here the transept extends to the full width of the church, and displays the finest sculpture in the building. The elaborate decorations on the walls—statues of saints, curved Gothic tracery, with figures of children, and the colossal coats-of-arms of the Catholic kings, supported by eagles and accompanied by their badges and initials—should be carefully observed. Long inscriptions in Latin and Spanish refer to the glories of the Royal founders of this truly regal chapel.

Cardinal Mendoza, who was primate of Spain at this time, obtained the services of the architect Juan Guas to design the family palace at Guadalajara. Juan Guas was also assisted by his brother Enrique, and the latter no doubt is responsible for the fantastic design of the patio, as I can hardly conceive this to be the handiwork of the architect who produced the graceful Toledo Church. It must be admitted that this kind of treatment is very appropriate to a Southern climate. The charming effect produced by the brilliant sunshine on the rich orange-coloured stonework, reflecting the clear blue sky, is well impressed on my memory; nor can it be denied that this patio, with its two tiers of arcades, displaying the shields of the Mendoza and Luna families, and flanked with griffins and large heraldic lions, had a certain amount of elegance and quaintness. It was in this palace in 1495 that the great Cardinal Mendoza breathed his last in the presence of the Catholic kings. Here also Francis I. (of France) resided for some time before proceeding to Madrid as a prisoner of war, and was much fêted by the old Duke of Infantado.

With the advent of the sixteenth century native architects arose in Spain, notably the Hontañons, father and son, and when the idea of building a new cathedral at Salamanca arose it is interesting to note that in those days the vexed question of appointing an architect gave rise to considerable discussion, even between the monarch and his subjects. The following are the circumstances under which Hontañon was chosen to be the architect. In 1491 Ferdinand and Isabella sent a Royal command by letter to Cardinal Angers, making plain to him that the dark, small, old cathedral was no longer in keeping with their glory or that of the times, and asking him to take steps to collect funds for a new building. Little progress seems to have been made until 1508, when Ferdinand passed through Salamanca.

The famous Master of Toledo, Anton Egas, received a summons to build (served in his absence on two maids), but neither architect seemed to have been over-zealous in carrying out the Royal commands. Later, on receiving a more peremptory command from Queen Juana, the two delinquent architects hurried to the city, studied the conditions, and, after considerable squabbling with each other and the chapter, made drawings, together with a long Report.

This friction was too much for the Bishop, who, without further ado, summoned in 1512 a conclave of the most celebrated architects of the day—Juan de Badajos, Alonso de Covarrubias, Juan de Alava, and others. The result was that, three days later Juan de Hontañon was named architect.

After much deliberation it was decided not to pull down the old cathedral, and the new structure rapidly rose on a site immediately adjoining. The west front, with its profuse adornment of sculpture, was the first portion of the fabric to be erected, developing later lofty arches, slightly reminiscent of Peterborough. The centre arch is enriched from top to bottom with fine medallions, delicate ornamentation, and statues, executed at a later date by Juan de Juni and Becerra. Over the doorway are the Nativity and Adoration in high relief, and above them the Crucifixion, with St. Peter and St. Paul, flanked on either side by numerous Saints in niches.

Some twenty years later, after the erection of Segovia Cathedral by the same architect, the Gothic style was abandoned in favour of the new Plateresque style, and forms of the early Italian Renaissance.

During this transition the "Mudejar" style, as it is called, came into existence. In this connection the door of the Escuelas Minores at Salamanca, characteristically set in a blank wall, is well worthy of note as a specimen of civic architecture. Above the two archways forming the entrance are displayed the three escutcheons and the triple crown which proclaim the university to be Royal, and the heads of St. Peter and St. Paul which proclaim it to be Pontifical. These examples appear framed in a profusion of detail, in which the Gothic and Plateresque styles are charmingly assimilated. In Salamanca Diego de Deza, Archbishop of Seville, added the fine Plateresque façade to the Church of San Esteban, commonly called Santo Domingo.

Previous to this the well-known façade to the University Library at Salamanca had been erected to the supposed designs of Enrique de Egas. It forms one of the most brilliant examples of the reign of Ferdinand and Isabella, whose medallions are represented over the central pier of the doorways enclosed in a frame with a Greek inscription. Armorial bearings, busts, and other ornaments, including a relief of the Pope, are all skilfully worked into this unique piece of architectural scenery. The delicate manner in which the ornament is treated over the doorheads and increases in scale and projection as it ascends to the top is well worth noting; a refinement observable in Moorish architecture. On the whole this is a

superb piece of design. The motive is distinctly of Moorish suggestion and nothing quite like it exists in any other part of Spain.

The hospital at Toledo takes the form of a Maltese Cross. It was intended to have four patios, similar to the hospital at Valladolid. Enrique de Egas was entrusted, so it is stated, to make plans for both these buildings. At all events there seems to be no doubt that he was the author of the Toledo façade. The Arab influence is again apparent in the form of the general design.

The grouping of the windows, with the circular pediment over the doorway, is excellent were it not for the unfortunate effect produced by the rounded pilaster following the curve of the archway and suddenly taking a perpendicular course.

The finest and most perfectly preserved carvings in Spain are undoubtedly to be found in the interiors of the great cathedrals, and I propose now to refer to the sculptor's art displayed on many of the tombs. The subject of sepulchral monuments in Spain could alone fill a large volume. Their number is infinite, and to anyone conversant with Spanish history the greatest pleasure and interest are afforded by their examination. They present to the mind, with the greatest vitality and distinctness, men who have taken an active part in the national affairs of Spain.

The early tombs were in the form of sepulchres with carved sides and ends, not unlike the Roman sarcophagus. Then reclining figures were introduced, in some cases surmounted by quaint canopies. A good example of the sarcophagus type is preserved in the Convent Church of Las Huelgas, at Burgos. It is the tomb of the Infanta Dona Berenguela, daughter of Ferdinand the Saint, who founded this church in 1279. This is a work of great dignity, and a certain "tomblike" mystery is imparted by the projecting line of canopies, which cause a deep shadow to envelop the bas-reliefs decorating the sides.

There are also some really fine monuments in the cathedrals of Salamanca and Burgos. Many of them are richly painted. The predominating tints are red, dark blue, and white; there are also traces of yellow, possibly due to the sizing used in fixing the gilding.

Another interesting sarcophagus of the thirteenth century is at Avila, in the church of San Vincente. Unfortunately, it cannot be properly seen owing to a canopy having been erected over it in 1460; it is known as the tomb of the Martyred Saints—viz., SS. Sebina, Vincent, and Christina.

In the long lists of tombs of this period it is difficult to select one that is finer than another. Possibly the monument to Archbishop Lopes de Luna, in the See Cathedral at Zaragoza, may be considered to rank as a masterpiece; it is pronounced by authorities to be the work of French sculptors. The tomb is set in a deep recess decorated with a beautiful frieze of sculptured figures—a most original arrangement—which adds great distinction to the monument. The figures represent a company of monks and nuns, in a reverend attitude, watching over their benefactor reclining peacefully below clothed in Pontifical robes. The sarcophagus underneath is designed with simple dignity and reserve, and the figures are carved with much character and skill. Words fail one to describe this splendid work, representing as it does Burgundian art at its zenith."

Mr. Prentice then gave a long and interesting account of the monuments and retablos erected in churches which are so marked a feature of Spanish architecture, but space does not permit us to give this part of his paper. He concluded by saying:—

"Whether we wander through the deserted cities of Castille or make a pilgrimage to some remote cathedral it is manifest that in matters of art this once powerful empire has never ceased to exist, but still continues to rouse our wonder and admiration. Amidst crumbling decay still stand the monuments of Spain's greatness. If nowhere else in the world such glorious works of art are to be found amidst such poverty, let us hope for a speedy revival in Spain of those factors which will raise it once more to its former position amongst the nations and cause it to take its place amongst the highest artistic circles of the world."

Professor W. R. Colton,

in moving a vote of thanks to the lecturer, said he had always been profoundly ignorant of Spanish sculpture, but from what he had seen that evening, and, speaking strictly from the sculptor's point of view, he did feel that amidst all the magnificence one was a little bit lost. It seemed like gilding the lily. It looked like crowding up detail to excess and making it ineffective in that way. He noticed from Mr. Prentice's remarks that the architect or the master tracer had the sculptor under his direction, and therefore the sculptor was not to blame. On the other hand, the painter was free, and he coloured his excessive ornament vividly and beyond that gilded it. He daresay the effect was fine and barbaric, but one regretted that in all the work which was spent on this decoration there was not more reticence and more arrangement of spaces. He had been told that one of the most distinguished sculptors of this age obtained his inspiration from the study of Spanish sculpture, and that was possible, for he thought it was not so much in the sculpture itself where the difficulty lay as in the crowding up of such a mass of work into a very small space. Apparently the Spaniards of the period dealt with were much as people were to-day—the official architects quarrelled with the unofficial architects.

Professor G. Moira,

in seconding the motion, said it looked as if, in the old Spanish times, painters came to "a bit of their own." Just as the sculptors of to-day had it all their own way so did the painters in the times dealt with by Mr. Prentice. It must have been a great pleasure to them to paint over the work of the sculptors. There was no doubt about it that the feeling one had in seeing these beautiful things was that there was terrible overcrowding, but one must remember that the overcrowding was more due to a desire to illustrate than a desire to make an artistic production.

Mr. A. T. Bolton

said it was over twenty years since he followed Mr. Prentice's footsteps in Spain and saw a lot of the places which had been referred to that evening. He did not think that Spain was a country for the young architect to go to at first, who was commencing his studies. Things to be seen in Spain had been done elsewhere in France and Italy, and the things done in Spain should be seen after France and Italy had been visited. He thought the conclusion they would come to when they had seen the Spanish work was that painting was *the* art of Spain, and that Mr. Prentice was right in saying that the work of the Romanesque period was extraordinarily fine. The work at some of the Royal churches showed really what a wonderful period the Romanesque was, and how the Spanish were on the verge of developing work of extraordinary refinement and interest when it seemed the thread was cut by the introduction of Gothic, and, of course, under the powerful influence of France the north of Spain was completely carried off its feet and Leon Cathedral was simply a French Gothic cathedral. The upper part of that cathedral was completed in the Renaissance period, and when he was there there was a vast mass of stone accumulated at the bottom of the cathedral which was all the early Renaissance work which had been taken down. It must have struck them how all the wonderful screens and reredoses had survived. Salamanca was the Oxford of Spain, and there was no town in the country at which more time could be pleasantly spent. They had heard about the interesting decision to preserve the old cathedral at Salamanca, and it was the lantern of the old cathedral which inspired Richardson in Trinity Church, which he built in Boston or New York. Berruguete, who had been mentioned, enjoyed something of the skill of Michelangelo and Raphael, and the Palace of Charles V. in Grenada, the front of which was carried out in marble and stone, had his finest panels. They were carried out with all that life and knowledge of anatomy which Michelangelo was responsible for introducing. With the reredoses they got really into touch with one of the most characteristic things in the country. One came out of the bright sunshine into the dark, lofty cathedral, and came on the great reredos entirely gilded. Treated like that it became, as it were, an enormous piece of metal-work, and one could not judge it from the point of view of stone-work. It had a character of its own. The importance attached to the encaradores, or flesh painter, was due to the fact that the sculptures were virtually alive. One rather lost the idea of sculpture and saw in the work an actual figure. It was an intense craving for realism, and one could not understand Spanish art without understanding this craving. That intense craving for realism was as striking in Spanish architecture and sculpture as in its literature and painting. Spain, however, was a country which required reading up before one went, because there were none of the delightful casual things as in France or Italy. They had to go from one town to another to see things, for except for a few isolated castles and monasteries the country was rather deserted.

Mr. J. D. Crace

said the elaborate reredoses were not strictly shown as sculpture. They were the decorative focus of the church, and were treated somewhat as ivory carving might be treated. The explanation of them was rendered infinitely more clear by their colouring, and coloured sculpture was almost a speciality of Spanish work. Not so much stress had been laid on the remarkable carved figures in wood as might have been. They were remarkable both for the management of the proportion and the very impressive colouring which assisted in the explanation at a distance of the figures themselves. He was much struck with the crowding when in Spain. Even the exterior figure sculpture was crowded together in a way which very much diminished a recognition of the constructive feature, and the architecture would have gained had the sculpture been more restricted and placed with a better recognition of expression of the intention of the architect. The use of heraldry in the sculpture was very remarkable and effective, and if one was to think of heraldry in connection with architecture then Spain was the place to study it. The actual execution of the sculpture, he thought, attained the refinement of the French work. He quite agreed, however, that Spain was not the place for the young architect to study in.

The Chairman

said that no doubt when the war was over many architects would go to the places described, and in due time their studies would be digested and would help to form the British architecture of the future. British architects had a great power of assimilation, and a very sturdy digestion, but he thought, in spite of their mixed diet, British work would always have a very distinct British character.

The motion was carried.

Mr. Prentice,

in reply, said a great deal of the Spanish sculpture was very rich, but much of it was of genuine native inspiration. It could hardly be compared with that of other countries. Much of it was executed for the Church, and the statues were carved for the religious orders. He thought it could be claimed that Spanish character expressed itself more strongly in sculpture than in painting.

The Chairman announced that the next meeting would be held on Monday, March 1, when the election of the Royal Gold Medallist for the current year would take place, and would be followed by an election of members and other business.

FIRE PRECAUTIONS AND THE WAR EMERGENCY.

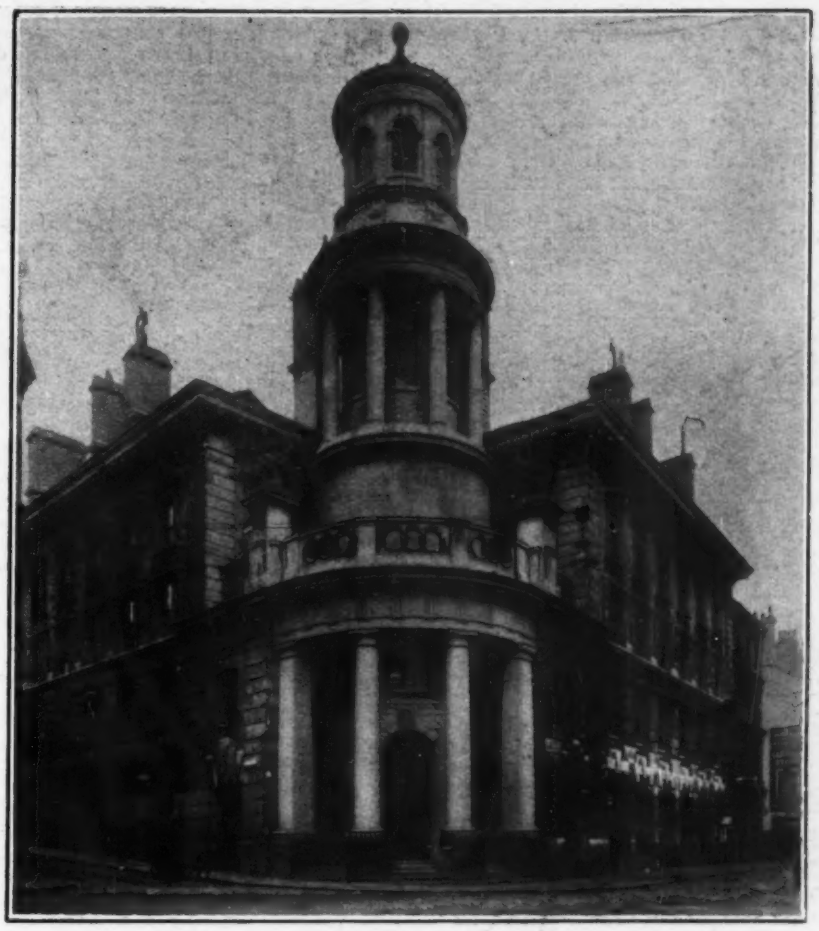
The British Fire Prevention Committee's special organisation to meet the war emergency has completed its first half-year's work. The work comprised mainly an extensive issue of fire warnings; the formation of a technical inquiry office to deal with all manner of technical inquiries; the formation of a Special Fire Survey Force of eighty hon. fire surveyors, entrusted with special duties; and the formation of a Special Fire Service Force of 300 fire brigade officers and men available for mobilisation at short notice. No fewer than 105,500 "fire warnings" in the form of small posters have been issued by the British Fire Prevention Committee, and distributed either directly or through the Government Departments and other public authorities concerned. Such "warnings" were specially prepared for military hospitals and refugee hostels (translations in French and Flemish also being made available for Belgian wounded and Belgian refugees). There were "fire warnings" for farmers as to grain storage, for troops billeted, and for factories engaged on Government supplies. The Technical Inquiry Office has dealt with many hundreds of cases, some of considerable complication. The Fire Survey Force has dealt with some two hundred surveys, and such surveys have occasionally required the inspection of quite fifty individual buildings.

THE COAL EXCHANGE, LOWER THAMES-STREET.

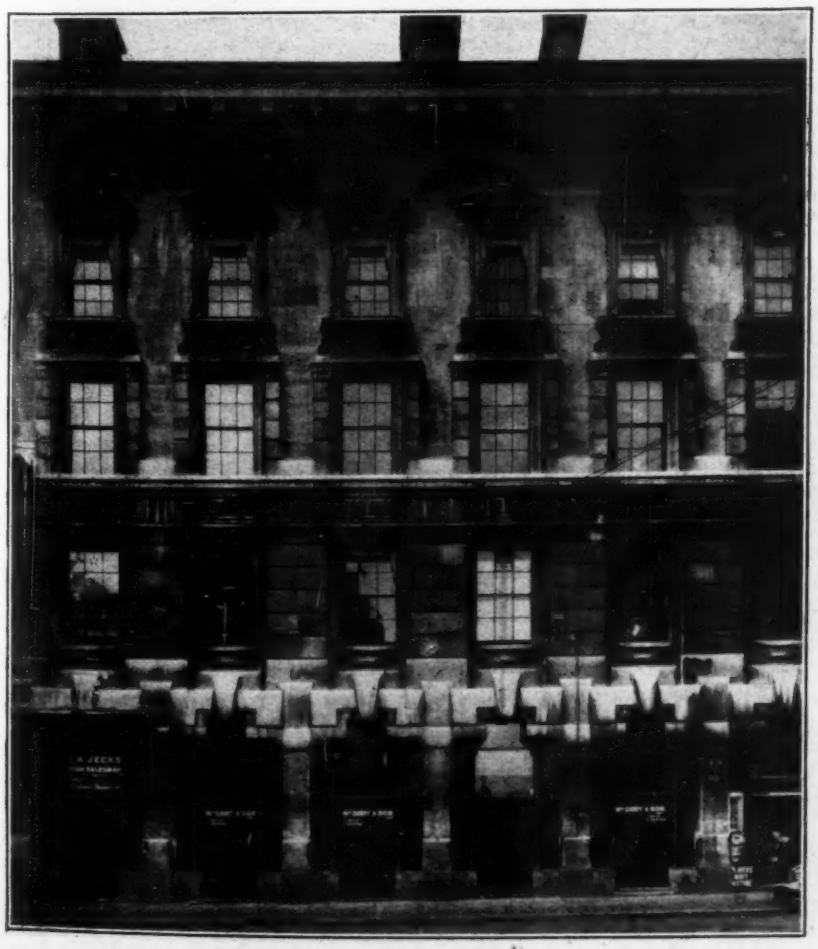
ONE of the most interesting buildings in the City is the Coal Exchange in Lower Thames-street, which is comparatively unknown. It was built in the late 'forties from the designs of the then City Architect, J. B. Bunning, and for ingenuity in planning it is remarkable. Bunning, as Donaldson informs us, "was a man not content with the mere routine of official duty (which, however, he carried out zealously and with stern integrity), he had higher aims, and with an earnestness beyond all praise he directed his efforts to give to his public buildings for the City the stamp of a monumental character worthy of the corporate body whom he represented. The Coal Exchange, which in less skilful hands might have been a commonplace mart, he arranged in a manner at once noble and convenient."

The architect planned a central circular hall 60 ft. in diameter, roofed by a glass dome rising 70 ft. above the floor, as the chief feature. The problem demanded an important entrance, and this was made on the angle. On the two main fronts the circular hall is masked by astylar wings, which in turn are linked in effect by the circular tower and entrance. The whole composition is astonishing in its boldness of line, ingenuity of plan, and light and shade effects. The scale of the structure is very dignified and the detail sound. The view of the interior of the building shows three light iron galleries from which open various small offices for merchants and salesmen. The slight and appropriate decoration illustrates the formation of coal. The plan view shows the beautiful parquet floor of stellar design. The façade to Lower Thames-street is a curious experiment in shop design which detracts from the other work, but so fine is the general tone that this defect is almost unnoticeable. During the excavation of the site of this structure Bunning induced the Committee to expend a considerable sum to retain and render accessible the previous ancient Roman thermal hypocaust which lies at a great distance below the foundations of the structure itself. Bunning was also the architect of the New Cattle Market at Islington, which in its lay-out equals any similar Continental scheme, the pavilions and details being exceptionally good. The last work carried out by this public-spirited man was the striking embellishment of London Bridge and the decorations of the public buildings on the route of the *cortège* which welcomed Queen Alexandra to the metropolis when she first came as Princess. These fine schemes are recorded in the illustrated papers of that day, and many of Bunning's working drawings are now in the office of Mr. Sydney Perks, City Surveyor.

Many architectural students complain of a dearth of material from which to make studies; the Coal Exchange offers an opportunity for studying a modern problem, and one, moreover, that is both unique and architectural.



The Coal Exchange.
J. B. Bunning, Architect.



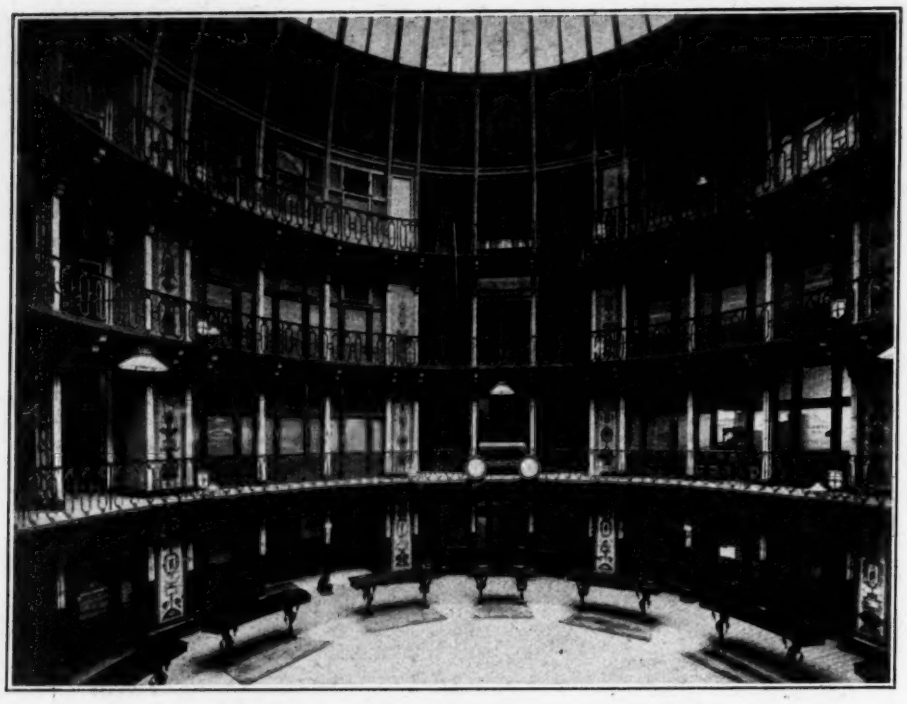
The Coal Exchange: Detail.
J. B. Bunning, Architect.

INSTITUTION OF MUNICIPAL AND COUNTY ENGINEERS:

BUILDING BY-LAWS.

A MEETING of the Institution of Municipal and County Engineers was held at the offices, 92, Victoria-street, Westminster, on Friday evening, February 5, when Mr. H. D. Searles-Wood, F.R.I.B.A., read a paper on "Building By-laws and a Court of Appeal," which we printed in our last issue (page 150). We give herewith some notes of the discussion which followed:—

Mr. E. Willis (Chiswick),
in proposing a vote of thanks to Mr. Searles-Wood for his paper, said he was not aware that the law was such that where a man put up a wall that abutted on his neighbour's wall he acquired a prescriptive right to support after twenty years. He never realised that, although they all studied the law of easement to a certain extent. A large part of the paper was simply a description of the London Building Acts so far as related to the Tribunal of Appeal. This was extremely useful for London, but he was not sure that it was quite so useful for the country, where the circumstances were so totally different. In the country they had not got the County Councils as the supreme authority, and he was not so sure that they wanted them. He appreciated the County Councils and their engineers and the work they did, but he doubted whether they wanted to throw any more work on them and to have a Tribunal of Appeal in the way suggested or outlined by Mr. Searles-Wood, whose experience, both in London and the provinces, was probably great; but the problem was, Ought they to have discretionary powers in by-laws? And they must settle that point before they got on to the question of tribunals. The old *Liber Albus* mentioned by Mr. Searles-Wood was extremely interesting, but he noticed there was an entire absence of any mention of the rights of light in the clause he

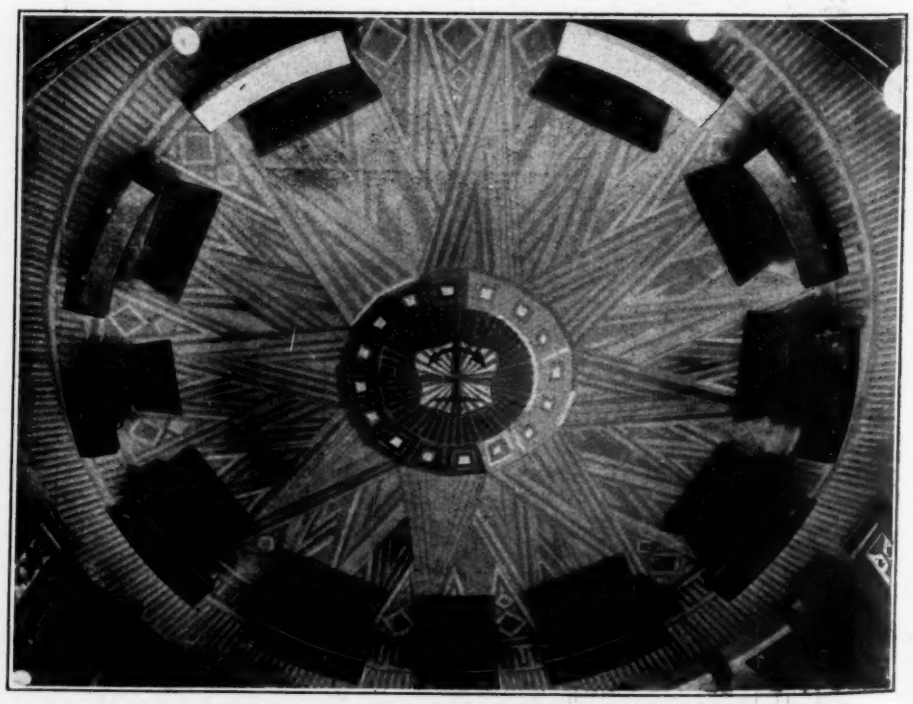


The Coal Exchange : Interior. (*See page* 173.)
J. B. Bunning, Architect.

had quoted. The author had said that the by-laws were only concerned with the safety of the public and not of the owner. He was glad of that, but he thought they very largely covered the safety of the occupier. It was that that the District Councils had to consider, and they did occasionally come across youthful architects who sometimes had to have the stresses of girders and columns increased. They would have been absolutely unsafe if he had allowed them to be put in in the form proposed, and the reputation of the architect would have been impaired. Then Mr. Searles-Wood had mentioned some of the points with regard to reinforced concrete. He agreed that the time had come when they must have some by-laws, but he thought it was better to sit on the fence until they received the thorough discussion they were receiving in connection with the London by-laws. He did not agree with Mr. Searles-Wood in his statement that it was impossible to make the Building By-laws a complete code of building construction. He (Mr. Willis) thought the by-laws should be a complete code. Then there was the suggestion for a general Building Act for the whole country. That would be useful, but he did not think they could get over the fact that what was suitable for one district was not suitable for another, and that was the object of the Local Government Board in revising by-laws for each district. Therefore, if they had a general Building Act for the whole country there would have to be special regulations governing many of the districts. There was just the question as to the constitution of the proposed tribunal. The first point was to settle whether it was desirable, but he would not discuss that. The constitution of the London authority was very excellent and its work admirable, and if ever it was considered to be desirable something on those lines might meet the difficulty. In substance he thought he was in sympathy with Mr. Court in not cutting down working-class dwellings too much in the matter of the height of ceilings; he would rather increase the sanitary facilities of the cheaper description of houses, and not economise at the expense of health.

Mr. A. E. Collins (Norwich)
remarked that Mr. Searles-Wood's paper, with its suggestion of a Court of Appeal on by-laws, was very interesting to anyone who knew what the difficulties were. One wanted to be reasonable, and sometimes they had got to stop things which they regarded as reasonable because the by-laws had to be administered. He was afraid it was impossible to have by-laws and not carry them out when they thought they ought not to be carried out. If there were a properly constituted Court of Appeal they would be able to insist upon an actual compliance with the by-laws, knowing that they were not inflicting hardship upon anyone, because if the building owner thought the surveyor's construction of the meaning of the by-law was wrong he would have a Court of Appeal to decide the matter. He could not agree with Mr. Searles-Wood as to his proposed tribunal. The County Councils throughout the country would be the worst possible Court of Appeal. In the country the County Councils had nothing to do with buildings, and it appeared to him the Courts of Appeal should consist of selected persons in the area. In England there might be sixty Courts of Appeal, each dealing with a certain area. He thought the general line of the tribunal of appeal for London would be the sort of thing they wanted for the country generally. The leading men in the profession indicated in the paper for London would be elected by the local authorities to form the Court. With regard to the by-laws, these would have to vary with the character of the district and the building. That was to say, if they were building a house that stood by itself and there was no risk of fire to other buildings, the by-laws for the construction of walls might be very different to a house built in close proximity to other houses. He thought the latest by-laws of the Local Government Board provided for that kind of thing. There was a different code for rural districts other than that for urban districts. He did not see why one code should not apply to all districts, with different clauses to suit the requirements of each district. The aim of the local authorities should not be to make building impossible by adding largely to the cost of building. The sanitation and the stability of the building should be completely provided for, but with regard to by-laws to prevent the spread of fire they should depend upon the locality. With regard to the reinforced concrete by-laws, he thought the code the London County Council were working out was the best to adopt, but whether local authorities would adopt such a complicated system was another matter. They were now getting reinforced concrete buildings put up in rural districts for manufactories, and one could not expect that the surveyor of a small rural district would be able to enforce the complicated by-laws of the London County Council. He would be very glad if there was an alteration of the law as to party walls. He was quite in sympathy with everything Mr Searles-Wood had said in regard to that.

Mr. Norman Scorgie (Hackney)
said a good deal of misconception existed as to the Tribunal of Appeal in London. Both Mr. Willis and Mr. Collins had spoken as if the Tribunal of Appeal was against the Building By-laws; as a matter of fact, the Tribunal of Appeal had nothing whatever to do with the construction of buildings. The right of appeal was on such points as the prescribed distance from the centre of the road; any buildings proposed to be erected beyond the general line of buildings; and the certificate of the Superintending Architect as regarded what was the general line of that building, and the certificate of the engineer as to whether the land should be built on or not if it came within the definition of low-lying land. The Building By-laws were dealt with by the District Surveyors of the several districts, and the London County Council and the Tribunal of Appeal had nothing whatever to do with that building. If the District Surveyor made any requirement upon a building owner, and that building owner did not choose to comply with that request, then the proper course would be for the District Surveyor to serve a notice of irregularity, and, if the owner did not comply with that, then it was the business of the District Surveyor to take him before a stipendiary magistrate, and not the County Council at all. It was not made very clear in the paper, but those of them who had to deal with the Tribunal of Appeal rightly understood that its province was limited, and it was only actions on particular subjects, when the County Council or the building owner might be the aggrieved party, that were taken to the Tribunal of Appeal as the independent authority. While dealing with that Tribunal of Appeal might he make a remark on Mr. Searles-Wood's statement that "the rules laid down in the Metropolitan Building Act of 1854, for dealing with the rights of the building and adjoining owners of a party wall, have worked so well that it is surprising no other city or town has adopted the same



The Coal Exchange Floor. (*See page* 173.)
J. B. Bunning, Architect.

system"; and further on in this paper, "that some such system should be part of the statute law"? He should like to ask, Was 1854 a misprint for 1894?

Mr. Searles-Wood: No, sir; this is the first Building Act—a private Act, not a public Act.

Mr. Norman Scorgie agreed that the whole of the Building Acts were consolidated by the London Building Act of 1894, and the laws were statute laws; and these dealt with party structures. If there was a party structure, by the Act of 1894 he had to serve a notice on the adjoining owner. He had a case in which he had to serve notice, as the foundation of his structure was going lower, and had to describe the work he was going to carry out.

Mr. Searles-Wood: It only applies to the metropolis. It is a private Act, and not a public Act.

Mr. J. S. Brodie (Blackpool): It applies to a district.

Mr. Scorgie said it applied to the metropolis. He agreed with Mr. Willis as regarded the discretionary power in by-laws. He thought that would be a very unwise thing. They knew very well that this country was at present locally governed in small areas, and those of them who had had experience in those smaller areas knew what influences would be brought to bear upon officials if any discretionary power was given under the by-laws. If they could say, "Those are the by-laws," they could require them to be carried out, and everything went on smoothly, but if discretionary power was given, even to the Council, they knew what wheels there were within wheels in small areas. He felt it would not conduce to the better government of this country, or better sanitation, or more healthy dwellings, or the health of the people. Regarding reinforced concrete structures, he, like Mr. Collins, hoped something would be done soon. The Local Government Board had had these present rules of the County Council under consideration for some time, but even when they did come back he doubted whether they would conduce to building in reinforced concrete, for he had the authority of architects, with experience of these rules, for saying that if the rules as forwarded by the London County Council to the Local Government Board were adopted it would be cheaper for persons to build with brick or stone than with reinforced concrete, as so very little saving would be effected under the metropolitan rules.

Mr. W. R. Davidge (Lewisham)
said that, as a District Surveyor in London, he would like to serve Mr. Scorgie with a notice of irregularity with regard to one or two of his remarks. The Tribunal of Appeal in London had very considerable powers as regarded the construction of buildings. These were not often used, but nevertheless they had the powers, and, as they knew, District Surveyors in London were the persons who, in the first instance, prescribed what buildings should be; but apart from that the Tribunal of Appeal had full power. It said much for the architects of London that that power was very rarely used. But the fact that there was that provision was a reason why the law was wisely administered. He thought the paper hardly conveyed what was at the back of Mr. Searles-Wood's mind. But the remarks of Mr. Willis and Mr. Collins had brought out of that proposal something that was more workable for the whole country. As he read the proposal of the author it was simply a tribunal that would interpret the by-laws, and, as he understood Mr. Willis and Mr. Collins, it was to twist that proposal round, so that that tribunal would have some power of revising and altering the by-laws in particular cases. As to two of the proposals put forward by them, that of Mr. Collins was the more important. If they had power to alter or revise in a particular case, it must not in fairness be left to the local authority; it could only be workable if left to some independent tribunal, as suggested by Mr. Searles-Wood, and very much improved by Mr. Collins' remarks. Something of the kind was workable, but to leave it to the discretion of the smaller authorities was unthinkable and impossible in working. The great distinction and the principle he thought they ought to keep in view was to discuss the possibility of varying the by-laws in any particular case, and the best means of bringing that about. It was, he believed, agreed that the local authority ought to have definite rules to work on, but these should be relaxed to meet the circumstances of certain districts. On the Continent and in the Colonies it was customary to divide the districts up into zones instead of having a cast-iron system of by-laws. A tribunal was undoubtedly what they ought to aim at. The point that ensures the smooth working of the London Building Act was the presence of this Tribunal of Appeal. The Tribunal was talked about very much, but did very little work, for the number of cases in twelve months could be counted easily on the fingers of one hand; two or three cases, was well within the average. When they considered that the number of buildings and alterations dealt with by the District Surveyors every year was somewhere about 40,000, they would, he thought, see the great advantages of having the Tribunal. [Mr. Scorgie: How many of those 40,000 would it be possible to take to the Tribunal of Appeal?] He thought it fair to say that the powers of the Tribunal were limited, but not so limited as Mr. Scorgie suggested in his original remarks. But the discretionary powers Mr. Scorgie regarded as better vested in the Tribunal and not the County Council, which, after all, outside London, was not the building authority. They had in London practically a composite system. The County Council were the Court of Appeal, and could allow modifications, and the Tribunal of Appeal, to whom the public could appeal in the case of what they considered unjust treatment by the London County Council or the District Surveyors. They realised that London was different, and the Building Act of 1189 mentioned by Mr. Searles-Wood was, after all, only one of a long series of Acts which had led steadily down for 725 years. It might interest them to know that many of these ridiculous provisions in the by-laws, such as that dealing with parapet walls through roofs, dated back to 1707, in the time of Queen Anne, when the only provision for dealing with fires was the village squirt, and it was time these provisions were overhauled. Another provision related to the setting back of window frames and revers. They could learn a lot from the London practice, and also what to avoid, and he thought that meeting would do well to confine its discussion to the ideal set out by the author, and especially the ideal elaborated by Mr. Collins. If it was possible to vary by-laws they were all agreed there were many cases in which they should like to see that done, but he did not see how they could allow small authorities the power of discretion. Something in the nature of a tribunal was, he felt sure, the eventual outcome they ought to aim at—not a tribunal to interpret by-laws, but a tribunal to alter by-laws to suit particular cases.

Mr. T. Reader Smith (Kettering)
said that as a country member he should like to have some tribunal to which disputes as to the interpretation of by-laws could be referred, but he should be sorry to see that body the County Council. Members of County Councils were mainly country gentlemen with no interest in or knowledge of building. They did not always get on with these councillors as smoothly as they might, and they would not like to have this further bone of contention introduced. He thought they would prefer the Local Government Board. With reference to Mr. Court's paper, he had been making visits to housing schemes, and it might be interesting to state that all those he had seen had been carried out under the ordinary by-laws, and no one thought they had been badly hit by them. He should be sorry to see the height of rooms reduced or walls of less than 9 in. between himself and the weather; he should personally prefer them to be 11 in. with a 2-in. space between the bricks.

Mr. C. J. Jenkin (Finchley)
stated, in regard to the question of discretionary by-laws, that at a meeting of the Town Planning Institute a short time ago it was unanimously agreed that, although in some cases these discretionary powers were advisable, it would be fatal to put that power in the hands of local authorities. By the very virtue of their constitution they were not suitable to be a tribunal in their own district. There were cases in which it was very difficult to know what to do, especially in by-laws which were ambiguous. One could not build properly without good by-laws, and he had never seen one code which was good from beginning to end. On the question of discretionary powers he had heard many builders say that they would rather go into certain districts where the surveyors understood the by-laws and carried them out than they would build in districts where the by-laws were interpreted by the officials. He knew that every official tried to be fair, but he knew of cases of glaring unfairness where the official had decided in one way in one case and differently in another. For that very reason the doubt that existed in people's minds would prevent building taking place in certain districts. If they had a tribunal in the hands of some impartial body like the Local Government Board it would be very helpful and useful, but to give discretionary powers to local authorities was highly undesirable.

Mr. S. G. Turner (Richmond)
said he was unable to appreciate the subtle distinction to be drawn between a private Act of Parliament and a statute. A private Act and a public Act were equally statutes, and a by-law, although not a statute, if properly made and confirmed had just as much force as a statute. It was just as well in discussing by-laws that the point should be borne in mind. There was this distinction, however, between a by-law and an Act of the Legislature. No one could question the power of Parliament to pass any Act it liked, but in the case of a by-law, if it were not within the powers given by the statute under which it was made it could be declared void by the courts. With regard to by-laws, three kinds of questions might arise—first, as to the validity of the by-law itself; second, as to the interpretation of the by-law—that, again, was a question of law; third, as to whether in any given case the requirements of the by-law should be dispensed with. The questions which went before the Tribunal of Appeal in London were either questions relating to the building line or to the construction of public buildings, in regard to which there were no by-laws or statutory provisions, the matter being within the discretion of the District Surveyor. Only if there were no by-laws, or if the by-laws could be dispensed with, would there be any work for the proposed by-laws appeal court to do. He doubted whether a discretionary dispensing power would be advantageous to the municipal engineer. It would cast a great responsibility upon him. It occurred to him also that there would be a considerable addition to the responsibilities of local authorities if they had powers to dispense with the by-laws, but there was room for some independent tribunal to which some power of dispensation might be given. With regard to by-laws and housing, one speaker had said that in most cases local authorities conformed with their by-laws. It was a remarkable fact, however, that some authorities had not done so, thus acting quite illegally. Local authorities had no more power to dispense with the by-laws than the private builder. He was not at all sure that the very difficult question of dispensation could not have been solved on lines something like those suggested that night by creating an independent tribunal covering a large area, to which, in exceptional cases, some kind of appeal might be made.

Mr. J. S. Brodie (Blackpool)
said that throughout the discussion he had been much surprised to find a kind of tacit consent among members that there was no such thing as a Tribunal of Appeal outside London, but, seeing that he had on two separate occasions been hauled up before such a tribunal, he knew that it existed. In the course of his career he had twice appeared in a Court of Quarter Session to show good and just cause for the reason that was in him for saying that he could not allow the authority to pass the plans. In both cases, after a lengthy hearing and all manner of hard swearing, he was pleased to say that that Court of Appeal gave a decision in his favour, and he was very grateful to them. As to a point Mr. Turner had touched upon as to local authorities having to observe their own by-laws, everyone present knew that the public authorities, when they were allowed, were the worst sinners in the breaking of by-laws, worse even than the most disreputable of owners. He, on one occasion, advised his people they could not do what they were going to do unless they broke the by-laws, and he told them he would not be a party to breaking the by-laws. They put the case before the Local Government Board, and got a dispensation from the Board to set aside the by-law. That was a distinct case of their own. Now, with regard to the discretion, all he could say was that those who were advisers of local authorities knew that quite enough discretion was taken without giving the authority. If they began giving them something no one

knew where it would end. He would give no discretion at all, but would lay down a hard and fast rule. So far as he knew, no public authority could do anything of the kind. He heard the remarks of Mr. Searles-Wood with regard to party walls with the greatest pleasure. After all, the question of party walls largely depended upon the conveyance of the land, and the landowner, if he was wise, put in his conveyance a provision that cleared up the question of party walls for once and all. The law seemed very uncertain as to what they could do, but if the selling owner put it in his covenant how it was to be dealt with, then there was no further difficulty in the matter. There was the general question as to what by-laws were made for. He always thought by-laws were made, first of all, for the protection of the occupier, and he very frequently needed protection from certain builders. Then there was the protection to the general public, and, of course, protection of the neighbours of the house in question. In regard to the complete code of building construction, he hoped they might be preserved from anything of that kind; that would be one of the greatest mistakes they could make. It would shut out all enterprise, make everything to a cast-iron pattern, and they would be in the position of the unhappy Germans if they attempted anything of the kind.

Mr H. T. Wakelam (Middlesex),
speaking for representatives of County Councils, said they were the last people who desired to have anything to do with building by-laws. He had had something to do with the construction of by-laws, and he knew the difficulties they had to contend with. It was not always a pleasant thing to construe them, and the manner in which the builders desired to construe them was one with which he could rarely agree. He could assure them that the County Councils did not want to be the authority for by-laws. In Middlesex there were six hundred buildings they had to license for stage plays, dancing, and music. The condition he always made was that they should bring him the certificate of the local authority, and let him know that their by-laws were complied with, because if they were according to the by-laws Mr. Willis had to administer he was satisfied that they were in order. With regard to the Tribunal for Appeals on by-laws, he thought the London County Council were on the right lines. One speaker said they did not have many appeals to hear, which was so much the better. If the County Councils were made the appeal authority, which he hoped not, he trusted they would not have many appeals made to them. With regard to reinforced concrete buildings, he thought something should be done with that class of building which was springing up on all sides in Middlesex. This should be done if it was only to satisfy the public that they were sufficiently sound and stable. At present the public were not satisfied, and it was said that many of these buildings were flimsy structures. Personally, he thought some regulations should be framed by the Local Government Board, and experts brought together, and definite lines laid down with regard to these buildings and the regulations with which they must comply. He was absolutely in agreement with Mr. Brodie that there should be no dispensing with anything in the by-laws. He knew what the trouble was in regard to buildings. They had in Middlesex standing orders, and there were certain dispensations, and they were the bane of his life.

Mr. F. Wilkinson (Wimbledon)
said he had had to deal with a case of a plan which did not conform with the by-laws. The architect stated that under the Education Act it was not necessary to comply with the by-laws if the Board of Education passed it. That was an instance of a Government Department breaking the by-laws which they had in force. As regarded reinforced concrete, he thought generally that rules for calculating the stresses ought to be adopted all over the country. If one did adopt rules and could enforce the architect to give the loads he proposed to carry, one could then decide whether they were suitable or not. Wimbledon being a residential district, the troubles they had had with architects had been solely with regard to the height of windows and as to what was a two-storied building. He had not experienced much trouble with the first and had had a great deal with the other. A certain section of architects wanted very low windows indeed, and he did not agree with these at all. As to the Tribunal of Appeal, he did not think that would be very helpful to surveyors in the country. He agreed that by-laws should be harder even than at present, for when one had to deal with councillors one had to press very hard sometimes for by-laws to be carried out.

Mr. Searles-Wood,
in reply, said he was rather amused to be treated as though he was a member of another profession. He was for twenty-five years a District Surveyor, a member of their own profession. He would like to point out to Mr. Turner that the Act of 1909 gives a considerable amount of waiver for certain things. They were all constructional points, in regard to steel framings, and the same thing with regard to reinforced concrete. In the skeleton iron framing they could always ascertain the strength of a building, but when the framing was covered with concrete it was very difficult to tell what the strength of the building was.

ARCHITECTURAL SOCIETIES.

Sheffield Society of Architects.

Before the Sheffield Society of Architects and Surveyors, Mr. W. S. Purchon, A.R.I.B.A., lecturing on the 10th inst. on "Architecture and Environment," referred to the great architectural glories of Rome, Greece, and Egypt, thence passing on to detailed references to the Romanesque and Gothic eras in Western Europe and to the spread of the Renaissance in England and France. He explained that he wished the character of the work of past ages to be extended to-day and that his remarks had been influenced by a desire for education. No architect was ever called upon to prepare a building which possessed no environment, and he sought to blend the environment with the building so as to get an harmonious whole.

The Architectural Association of Ireland.

An ordinary meeting of this Association was held on the 2nd inst. at the rooms, No. 15, South Frederick-lane, Dublin. The Vice-President, Mr. Frederick Hayes, F.R.I.A.I., occupied the chair. Owing to the regrettable indisposition of Mr. F. E. Eden, M.A., who was thus prevented from completing his journey to Ireland, his paper, entitled "In the Footsteps of Samuel Butler," was read by the President, Mr. H. Allberry, A.R.I.B.A. The lecture dealt with the interesting series of chapels to be found at Varallo, Orta, Varese, and other towns of Northern Italy, where groups of these buildings were erected as a setting for scenic representation of religious subjects, and the splendid series of explanatory lantern illustrations were followed with close attention. Mr. R. Caulfeild Orpen, R.H.A., President of the Royal Institute of the Architects of Ireland, proposed a vote of thanks to Mr. Eden, and Professor W. A. Scott, A.R.I.B.A., seconded the vote of thanks, which was passed with acclamation. The Committee proposed two resolutions, one dealing with the remission of subscriptions from members serving with His Majesty's forces; the other with a number of clauses in connection with the proposed entente between the English and Irish Architectural Associations.

The Royal Technical College Architectural Craftsmen's Society, Glasgow.

At a meeting of this Society, held in the Royal Technical College, Glasgow, on February 12, Mr. James S. Boyd, Licentiate R.I.B.A., chief assistant and lecturer in the Architecture Department, gave a lecture on Stereotomy. At the outset the lecturer defined stereotomy as being the science of stone-cutting. By numerous blackboard sketches, diagrams, and slides, Mr. Boyd described the drawing-down and mould-cutting of several examples of scientific masonry, which included Gothic and ground vaults, domes, arches of double curvature, skew bridge, niches, ramp-and-twist work, etc. Also by the same means the lecturer described the various operations involved in the stone-cutting in each case. In concluding, he urged all young members of the architectural profession and of the masonry crafts to uphold the dignity of their calling by applying themselves to the study of the scientific side of masonry. This could, to a certain extent, be accomplished by mastering that practical application of geometry which embraces scientific masonry work, and by the sketching and photographing of existing specimens of old and modern work.

THE SURVEYORS' INSTITUTION.

AN ordinary general meeting of the Surveyors' Institution was held on the 8th inst. at No. 12, Great George-street, Westminster, Mr. Howard Chatfeild Clarke, President, in the chair.

The adjourned discussion on the papers read by Mr. J. G. Head (Fellow) and Mr. Joshua Bury (Fellow) on "Urban Land Tenure" was opened by Mr. J. D. Wallis (Member of Council).

In the course of his remarks Mr. Wallis said he found himself in general agreement with the conclusions of the authors, but the subject required thoroughly discussing from all points of view. The subject was of such magnitude that it was impossible to deal with the details of the proposals in one evening, and therefore he would confine himself to referring to some of the chief recommendations of the Land Enquiry Committee. The two main proposals were that the lessor should not in future appropriate tenant's improvements without compensation, and that lessees might acquire fixity of tenure by obtaining the right of renewal of a lease on terms to be fixed, if not agreed upon, by an independent tribunal. Mr. Wallis discussed the question of short and long leases, and pointed out that one advantage of short leases was that it enabled large landowners to carry out improvement schemes, and there was no doubt that the system was responsible for the successful laying out of important and progressive towns. He agreed that what was wanted was elasticity in the freehold system, and that might be secured by a well-considered scheme under which the lessee would secure renewals from time to time on terms which would take into account the changing conditions and would provide for the general progress and improvement of the neighbourhood. With regard to the recommendations applying to leases of land and buildings for business purposes at rack rentals, there was, no doubt, keen competition for shop sites in busy centres, and in some cases a hard landlord had the opportunity of exacting terms which bore very severely upon the tenant. He felt that lessees might properly be compensated for improvements which added to the value of the property if they were carried out with the permission of the landlord. On the other hand, the tenant must be liable to pay for dilapidations. As to the tribunal, he favoured the suggestion that a panel of surveyors should be selected containing representative men from each district, and a tribunal selected from such men could meet with confidence.

The following gentlemen also took part in the discussion:—Messrs. J. H. Blizzard, Harper, Theodore Chambers, E. Whitton Booth, Chas. Osenton, and Gilbert Mould.

At the conclusion of the debate Mr. Head announced that the President had kindly given him permission to write his replies to the various questions raised, so he would not take up any further time of the meeting. He appreciated the interest which the subject of his paper had aroused, and wished to thank the gentlemen who had spoken; and said that he was infinitely obliged for the way in which they had put their opinions on the subject.

CORRESPONDENCE.

The Board of Trade Offices.

SIR,—Your remarks *re* the administration of competitions in last week's *Builder* will, I am sure, meet with general approval in the profession.

Some assessors, if one may judge from the awards, appear to realise that the binding conditions which they lay down do not help towards the production of the most suitable design. In which case it would surely be to the advantage of a competition if the requirements of the promoters were conveyed to the competitors in the form of suggestions, and binding conditions eliminated, except for such requirements as are indispensable to the promoter, and these should be absolutely binding to both assessor and competitor alike.

So long as "binding conditions" (?) are treated as mere "scraps of paper," conscientious competitors would do well to realise that they are devoting their energies to what is practically guessing competition. CLYDE YOUNG.

Direct Labour in Building.

SIR,—You have put a very cowardly remark at the end of your "Note" on organised labour (p. 149) in your last number. It is also untruthful in its suggestion. At present 250,000 of the men you sneer at are concerned in fighting the destroyers of Reims and Louvain Cathedrals on our behalf. You will find many thousands of their names inscribed on Rolls of Honour at the offices of nine out of ten of the firms who advertise in your paper.

When this war is finished a great proportion of these men will have been killed or wounded by their (for the time being) enemy.

If the suggestion I complain of is really sincere, then one may naturally judge that the action of the Germans in putting their hate into practice against those of our fellow-countrymen who happened to be trade unionists must afford you much private satisfaction.

J. BINES
(Late Artists' Rifles).

[*.* The action of organised labour as trade unions was referred to in the "Note" in question, not the action of the component individuals who compose the unions.—ED.]

The Thames Floods.

SIR,—Mr. Lethaby, in his address before the Architectural Association recently,* alluded to the Thames floods as one of the pressing problems needing attention. They are indeed becoming more frequent and a serious nuisance and source of expense to dwellers by the river. The remedy needs no great outlay and presents no engineering problem, for the Thames would not be subject to floods if let alone. There are no guts or natural impediments, the levels are ideal, the valley broad and chiefly gravel, and the hills mostly chalk, all absorbing rain and giving time to prepare. History is silent as to floods, and the fact that towns, and particularly religious establishments, were built on the banks, and not above on the hills, is very significant. The fall of the river from Oxford to Teddington is somewhat over 300 ft. or thereabouts, in a distance of about 95 miles, but 142 ft. of this natural declivity is blocked out by artificial barriers known as "locks," with their weirs, sluices, and dams. As Parliament sanctioned the erection of locks above Maidenhead Bridge in 1771, there were presumably none till then, yet a large traffic was carried on. The root of the matter seems to be that, while the Thames Conservancy, created in 1857, have unlimited power to dam, they have no responsibility for the results. As their revenue is principally derived from the boating and lock dues in summer, their attention is devoted to keeping up a head of water, while the passage of any surplus in winter does not trouble them, since they say they are not liable to make good damage by floods. It would cost but little to throw open the lock gates when floods are threatening and traffic *nil*. The accelerated current would do the rest, the tidal waters below Teddington Lock, the selected spot where the responsibility of the Conservancy ceases, easily carrying off all that flows down. Alternatively the capacity of the bucks and sluices should be increased, which would quickly be accomplished if the anomaly of power and emoluments without responsibility were ended by Act of Parliament.

J. STARKIE GARDNER.

Maidenhead Court.

Employment and Recruiting.

SIR,—In reply to "Ubiquitous," I know of one Government department where work has not been much increased, if at all, by the war.

But permission has been refused from the commencement of the war to members of its surveyors' section to enlist. Only one or two wished to go, but leave has been withheld in every case. Of course, one can understand that if a certain percentage had been granted leave the remainder would have had no cause to grumble. But when in addition to this there are well-founded rumours as to reduction of staff, it makes one wonder whether the Government departments (some of them) are playing the game. UNPALATABLE TRUTHS.

GENERAL NEWS.

Lieutenant Twelvetrees.

Second Lieutenant Richard Twelvetrees, A.M.I.Mech.E., A.M.Soc.C.E. (France), was gazetted First Lieutenant on January 20 last. Lieutenant Twelvetrees, who is a staff officer in the Mechanical Transport branch of the Army Service Corps, has been on active service with the British Expeditionary Force since last October.

* See our issue for January 29.

Housing Scheme, Wednesbury.

Wednesbury Town Council have approved plans for twenty-four artisans' dwellings which are to be erected under the municipal housing scheme recently adopted by the Council.

Westminster Hall.

Mr. King, in the House of Commons, asked whether the criticisms of Mr. W. D. Caröe, architect to the Ecclesiastical Commissioners, against the proposed treatment of Westminster Hall had been considered, especially in respect of the economies which would be made by Mr. Caröe's alternative proposals. Mr. Gulland's reply was as follows:—"The scheme of repair of Westminster Hall roof is based on a most thorough and exhaustive survey. It has been examined by Sir Aston Webb and Mr. Reginald Blomfield, both Past-Presidents of the Royal Institute of British Architects, and representing the Royal Academy and the Royal Institute of British Architects on the Ancient Monuments Board for England. These gentlemen, in reply to Mr. Caröe's letter in the *Times*, say that they consider the scheme adopted—namely, of reinforcement by steel framing—is the most satisfactory solution of the question. By it the maximum amount of old timbers of the roof will be preserved. Mr. Caröe's statement is not supported by any detail, nor is it known how his estimate is arrived at; in any case it would practically amount to the substitution of a new timber roof for the old one—an entirely undesirable proceeding in the opinion of the First Commissioner. He sees no reason, therefore, to change the principle on which this most important work is now being conducted."

Builders and War Office Contracts.

In the House of Commons Mr. Hudson asked the Financial Secretary of the War Office if he could say what was the amount of further contracts to be given out for the building of huts for soldiers in various parts of the country; and to what extent building firms who had already done in a satisfactory way a large amount of this class of work under sub-contract would now be placed on the lists and allowed to tender as original contractors. Mr. H. Baker said it was not expected that any further contracts would be placed for the erection of huts, except on a very small scale. Any building firm might apply to be placed on the War Office list, and any such application would be favourably considered, subject to the usual conditions as to capacity and financial soundness.

An East-End Boulevard.

In the course of a lecture upon "Cafés from Mile End to Piccadilly," given at the Women's Institute, Victoria-street, on February 10, Mrs. Hylton Dale referred to the depressing aspect of most of the tea-houses in London, and advocated the establishment of open-air cafés along the wide road—one of the finest in the kingdom—extending eastwards from Whitechapel to Bow Church, and also at the "big corners" of St. Martin's-le-Grand, St. Paul's-churchyard, Ludgate-circus, Aldwych, and Waterloo-place. The general idea is a development of the tea-tables in the Embankment gardens near Charing Cross and the Savoy, with music, trees, and other restful attractions.

Protection of the Elgin Marbles.

In view of the possibility of an air raid on London the Trustees of the British Museum have been at great pains to safeguard the varied treasures in their keeping. Special precautions have been devised for the protection of the building. The most precious of the easily portable objects were some time ago placed in vaults and other strong places at the disposal of the Trustees, and now the Elgin Marbles, the most famous pieces of sculpture in the Museum, are being removed to the security of the basement-rooms. When the arrangement of the collection in its new position is completed it will be again on view to the public.—*Times*.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Viscount Peel, Chairman, presiding.

Tenders.—The following tenders were received:—For extending bathroom and lavatories, etc., at the Homerton Residential School for the Deaf (Hackney, S.); for the erection of an elementary school on the Mellitus-street site (Hammersmith); for providing and fixing boilers and low-pressure hot-water heating apparatus at the Thornfield-road School (Hammersmith); for the execution of general works and repairs of a minor character; for penstocks for North Woolwich Pumping-station; for the erection of a dwelling-house and a cottage at the Crossness outfall.

Loans.—Loans were granted to public bodies as follows:—£1,013 to the Lambeth Borough Council for paving and repaving works; £8,173 to the Poplar Borough Council for electricity undertaking; and £1,980 to the Wandsworth Borough Council for contributions towards cost of street improvements.

Fire Stations.—Electric Radiators.—It was agreed, on the recommendation of the Fire Brigade Committee, that the provision of electric radiators in the appliance-rooms at the Bishopsgate, Brompton, Euston, Fulham, Holborn, Old Kent-road, Redcross-street, Shadwell, and Shoreditch fire stations be carried out by direct employment of labour under the direction of the Fire Brigade Committee.

Appointment of District Surveyor for Bermondsey.—On the recommendation of the Building Acts Committee it was agreed that Mr. Charles Archibald Daubney be appointed District Surveyor for Bermondsey as from and including April 6, 1915, and that his resignation as District Surveyor for Rotherhithe be accepted as from April 5.

Metropolitan Water Board—Deficiency Rate.—On the recommendation of the Local Government Records and Museums Committee, it was agreed that, in the opinion of the Council, the Metropolitan Water Board should promote, in the next Session of Parliament, a Bill to provide for the establishment of a more equitable system of dealing with deficiencies in the Water Fund, and that this resolution be communicated to the Metropolitan Water Board, and also to the representatives on the Board of the Council, of the City of London, and of the Metropolitan Borough Councils, with a request that they will support the proposal.

Hackney Marsh—Purchase of Adjoining Property.—It was agreed, on the recommendation of the Parks and Small Holdings and Allotments Committee, that the buildings on the property known as the "White House," adjoining Hackney Marsh, which has been acquired for addition to the open space, be demolished, and that tenders be invited from selected firms for the demolition of the buildings and the removal of the old materials.

OBITUARY.

Mr. T. Woodbridge Biggs.

The death occurred on the 1st inst. of Mr. T. Woodbridge Biggs, in his sixty-third year. The deceased gentleman for over forty years practised as a surveyor in the City and Holborn, and for a considerable period acted as Surveyor to the Latimer Foundation. Mr. Biggs was a Surveyor to the Metropolitan Water Board, and Quantity Surveyor to the Fulham Town Hall, and was also a Licentiate of the Royal Institute of British Architects. For many years past he had devoted a great deal of his time in conducting cases of arbitration. The business of the deceased will be carried on by his son, Mr. W. Woodbridge Biggs, at Union Bank-chambers, 61, Carey-street, Lincoln's Inn, W.C.

Mr. W. B. Cooper.

The death has taken place at his residence, Park Place East, Sunderland, of Mr. William Brown Cooper. The deceased gentleman carried out many contracts for the Durham County Council, and for several years was the sole contractor in Sunderland and district for H.M. Office of Works. A prominent member of the Sunderland Builders' Association, Mr. Cooper was President within recent years, and was Vice-President of the Northern Counties Federation of Building Trades Employers.

Mr. W. J. Cutbill.

We regret to announce the death, on the 27th ult., of Mr. W. J. Cutbill, Chairman of Messrs. Claridge's Patent Asphalte Company, Ltd.

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ILLUSTRATIONS.

Selected Design, Board of Trade Offices Competition.

We illustrate Mr. E. Vincent Harris's design, in this case giving his revised plans. We shall illustrate the designs of Mr. Cooper and Messrs. Adams & Holden in subsequent issues.

MEETINGS.

FRIDAY, FEBRUARY 19.

Royal Sanitary Institute (Manchester Meeting).—Discussion on "The Construction of Sewers," to be opened by Mr. S. S. Platt; and on "Housing from a Sanitary Inspector's Standpoint," by Mr. H. Dryland. 7 p.m.

Town Planning Institute.—Mr. George L. Pepler on "Economics of Town Planning in Relation to Land Development." 8 p.m.

Institution of Mechanical Engineers.—Annual general meeting. 8 p.m.

SATURDAY, FEBRUARY 20.

Royal Sanitary Institute.—Inspection and demonstration at the Lambeth Disinfecting Station. 2.30 p.m.

MONDAY, FEBRUARY 22.

Architectural Association.—Mr. A. E. Richardson on "Architecture of the Present and the Future." 8 p.m.

Royal Academy of Arts.—Mr. E. S. Prior on "The Arts and Crafts of the Flemish Renaissance." 4 p.m.

Surveyors' Institution.—Mr. Isaac Dixon and Mr. E. H. N. Ryde on "The Report of the Land Enquiry Committee on Rating." 8 p.m.

University Extension Lecture (at the Victoria and Albert Museum).—Mr. Banister Fletcher on "Westminster Abbey." 4.30 p.m.

WEDNESDAY, FEBRUARY 24.

Royal Sanitary Institute.—Inspection and demonstration in the district of Islington. 2.30 p.m.

Carpenters' Company.—Mr. Francis Bond on "A Comparative View of French and English Cathedrals." 7.45 p.m.

Royal Academy of Arts.—Mr. E. S. Prior on "The Two Eras of Flemish Sculpture and Painting." 4 p.m.

THURSDAY, FEBRUARY 25.

University Extension Lecture (at the British Museum).—Mr. Banister Fletcher on "Roman Palaces and Pompeian Houses." 4.30 p.m.

Society of Antiquaries.—Ordinary meeting. 8.30 p.m.

THE CARPENTERS' HALL LECTURES:

"WILLIAM MORRIS."

MR. H. T. L. J. MASSÉ, of the Art Workers' Guild, read a paper on "William Morris" at the Carpenters' Hall, London Wall, on Wednesday, the 10th inst., in which he gave a most interesting and useful account of one of the most picturesque and virile characters in the history of modern art, who influenced the development of art perhaps more deeply than any other man, and without whose work and teaching the progress that has been made in the last half century would have been impossible. The field in which he worked was as wide as that of the great masters of the Renaissance, and he made improvement possible not only by the actual work he carried out, but by the creation of a sympathetic attitude on the part of the public. He was poet, artist, manufacturer and socialist, and there is probably no part of the world which has not been enriched by stained glass, carpets, tapestries, textiles, and wall-papers from the firm of Messrs. Morris & Co.

He was born at Walthamstow in 1834, and as a child of nine used to explore Essex in search of old churches, and ride in the woods in a suit of armour. He was educated at Marlborough and Oxford, where his chief friend was Edward Burne-Jones, and took his degree there in 1856. In 1855 Morris and Burne-Jones and other kindred spirits formed themselves into a brotherhood. An independent income of £1,000 a year enabled him to strike out a career for himself. He was subsequently articled to George Edmund Street, where he made friends with Philip Webb and subsequently started a joint studio with Burne-Jones and came under the influence of Rossetti. He was working with the idea of becoming a painter, but poetry engaged more of his attention, his first work, "The Defence of Guinevere," being published in 1858. His famous house—"The Red House," the prototype of the Queen Anne movement—was designed for him by Philip Webb before his marriage, and the difficulty of getting suitable glass and china led to the founding of the firm of Messrs. Morris, Marshall, Falkner & Co., which, later on, became Messrs. Morris & Co., and the new firm exhibited at the exhibition of 1862. Later on, Morris gave up the idea of painting pictures, and devoted himself to the revival of the handicrafts. In 1866 he had a chance of showing his powers in decoration at South Kensington Museum, where he decorated the small dining-room known as the "green dining-room." He had moved up to town, but in 1871 moved out to Kelmscott in Oxfordshire, which afterwards gave its name to the Kelmscott Press. In 1881 he took Merton Abbey for additional workshops. In 1890 he turned his attention to printed books, which perhaps represent his greatest achievements. His death occurred in 1896. His leading belief was that Art was not for the privileged few but was "to be made for the people, and for the people as a happiness to the maker and user." It was "meant to raise man's life above the daily tangle and small things that weary him," and the first step was to raise the lot of the worker.

The speaker attempted to define the lines on which Morris worked in what he called the lesser arts. As to pottery, he said:—

1. The vessel must be of a shape convenient for its purpose.

2. The shape must show to the greatest advantage the plastic and easily-worked nature of the clay.

3. The whole surface must show the hand of the potter and not be finished with a baser tool (*i.e.*, turned on a lathe).

4. Smoothness and finish, though a quality not to be despised, is not to be sought for its own sake.

5. The commoner the material the rougher the ornament.

6. As in the making, so, too, in the ornament, the hand of the workman must always be apparent on it. Nothing should be painted on pottery except what could only be painted on it.

Weaving, he admitted, was a mechanical craft, but it should be honest, artistic, and not an attempt to make the fabric look as though it were a painting or engraving. For carpets and tapestry he advocated handwork. He bewailed the ruin of dyeing by the introduction of aniline colours, and he felt that the craft of printing patterns on fabrics had been degraded by the decay in the use of good and suitable dyes. For wallpapers he admitted the necessity of frankly accepting machinery, but such work should not simulate hand-painting.

Simplicity was, he considered, the one thing necessary in furniture. The "citizens" furniture was to be solid and well made, and to be joiner's work made of timber rather than of walking-sticks. By state furniture proper for a citizen, Morris meant sideboards and cabinets on which ornament need not be spared, but which could be elegant and elaborate with carving, inlaying and painting. He compared these to tapestry, calling them the blossoming of the art of furnishing.

He said that excess of furniture destroys the repose of a lazy man, and is in the way of an industrious man.

We have not space to do more than briefly refer to these few of the many points referred to in the course of an exceedingly interesting and instructive paper forming a complete record of an unusually full and eventful life.

COMPETITION NEWS.

It must be understood that the following paragraph is printed as news, and not as an advertisement; and that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that may occur.

The list of current Competitions is printed on page 186.

Paisley School Board's New Chambers.

Mr. John Watson, President of the Glasgow Institute of Architects, who was appointed by the Paisley Burgh School Board as assessor of the competitive plans for the structural alterations necessary to adapt the Globe Hotel as a meeting-place and offices for the Board, has now submitted his Report. The Board selected three numbers, and when the sealed envelopes corresponding to the numbers were opened the architects were found to be Mr. James Carruthers, I.A., 147, Bath-street, Glasgow, who has been appointed to carry out the work; Mr. William Brown, jun., 9, High-street, Paisley, who receives a premium of £10; and Mr. Matthew Adam, 160, Hope-street, Glasgow, who receives a premium of £5.

BOOKS RECEIVED.

ANCIENT AND MEDIÆVAL ARCHITECTURE OF INDIA. By E. B. Havell. (London: John Murray. Price 30s. net.)

THE YEAR'S ART. Compiled by A. C. R. Carter. (London: Hutchinson & Co.)

LAXTON'S BUILDERS' PRICE BOOK FOR 1915. (London: Kelly's Directories, Ltd. Price 4s.)

FIFTY YEARS AGO.

The Gentleman's House.

IN the third part of his volume Mr. Kerr considers questions of the site of the house and the grounds, to some of which, as he says, "both the architect and his client must give intelligent attention from the beginning," whilst others must be kept in view by the architect especially as belonging to his vocation.

The first question necessarily is the approval of the locality; the second the choice of a site; thirdly comes the whole question of the arrangement of the grounds around the site.

Had we been able to give a detailed abstract of the second part of the work—wherein the position most to be desired, of each living-room and office, in the general plan, is pointed out—it would have been seen how important are the first two of these questions to the realisation of those arrangements which are deemed best. Indeed, the reader may be disposed to think that, admirable as is the scheme of Mr. Kerr's treatise, the subject might have gained by a discussion of the questions of locality and site in the first half of the book.

In the choice of locality there are to be considered climate, shelter, aspect, ventilation, soil, water supply, drainage, salubrity, landscape gardening, and local considerations; and each of these is the subject of a separate chapter. Climate, according to our author, may be said to be "of four chief varieties—warm and cold, and in either case dry or moist." With our moist atmosphere, he says, there may be apprehended rheumatism, with the other malaria. An extreme of cold may be ameliorated by the shelter of wood; whilst excess of warmth may be tempered by shade. The summit of a hill may be too exposed; but low localities are damp and stagnant. "There is a medium, and the rule seems to be to prefer within the limits of that medium an elevated site." As to shelter, it is valuable if, for instance, the land slope towards an aspect of bleak winds, northward or eastward; and in some cases wood, south-westward, is valuable. On the sea coast, especially the east, shelter must be had if possible.

[*** We give the above extract from the *Builder* of February 18, 1865.]

CONSTRUCTION SECTION.

Soldiers' Wards, Norfolk and Norwich Hospital.
Messrs. E. Boardman & Son, Architects.

THE NEW SOLDIERS' WARDS AT THE NORFOLK AND NORWICH HOSPITAL. .

OUR illustrations show a photographic view, plan and section of an emergency ward in the grounds of the Norfolk and Norwich Hospital for the accommodation of wounded soldiers, which has been recently erected by public subscription, through the kind agency of the Norfolk News Company, Ltd. The building has a total length of 222 ft., the front having a southern aspect.

The centre portion is an administration block, consisting of a kitchen, larder, store, H.M.C. The kitchen is provided with a projecting glass bay, commanding a view of either ward to facilitate service and supervision. Of course, the central administration block of the main hospital will be available to supply the varied wants of these wards.

The wards are placed on either side of the administration block, and have doorways at intervals, giving easy access to a glazed verandah 10 ft. wide, which runs the whole length of either ward. Each ward is shown to contain thirty beds, and room remains for a few more if found necessary. This number of beds in relation to cubical capacity is in excess of the usual hospital practice, but the Management of the Norfolk and Norwich Hospital have, in most cases, adopted with great success an open-air treatment, and except during unusually inclement weather a large number of these beds will be placed on the verandah.

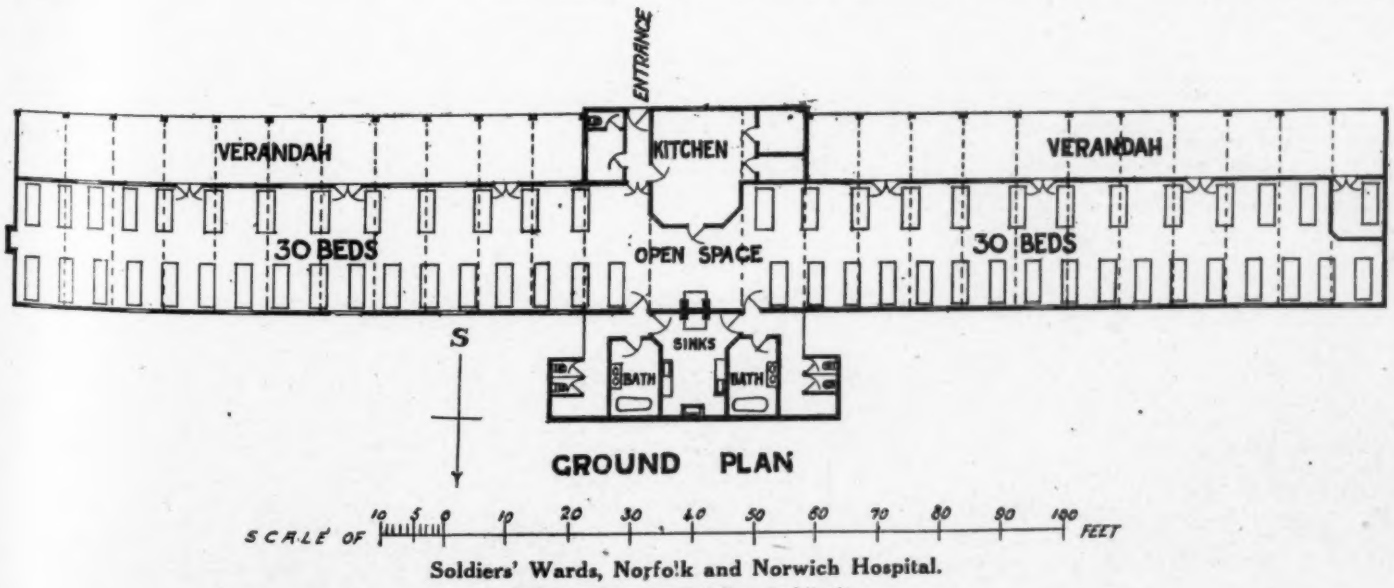
At the rear of the building is placed the sanitary block, consisting of bathrooms, sink-room, water-closets, and urinals, cut off from the wards by sheltered but open-air lobbies.

A great deal of care has been expended on the design of the wards to obtain a thorough and ample system of natural ventilation. For this purpose the wall plate on the north wall is kept at a level of 8 ft. 3 in., whilst that on the south side is 13 ft. 3 in., allowing a series of pivot-hung windows above the verandah. The verandah is partly glass and partly flat, with ventilation between the same to prevent the atmosphere under the glass becoming overheated during hot weather.

The building is an effort to produce wards which, although capable of being shut in in bad weather, are really open-air wards. Every part of every door and window will open to the fullest extent. The walls are framed in wood, covered both internally and externally with asbestos sheeting. The roof is tiled on boarding and the floor is of wood. The windows on the northern side, also those between the doors leading on to the verandah, open as hoppers; whilst the clerestory windows above the verandah are pivot hung. The wards are heated with two hot-air stoves, and a hot water supply has been installed to supply the service to the baths, sinks, etc., and the whole building is lighted by electricity. No painting or colouring has been undertaken at the present time, as immediate occupation is necessary.

This new building will bring the total accommodation for war patients up to 225, four tents having been previously erected. The Board is now enabled to provide for the care of soldiers requiring prolonged treatment, and they expect to comply with the desire of the War Office that they will receive a hundred fresh war patients every week.

Cost was a prime consideration, and it was therefore designed as plainly and inexpensively as possible, compatible with the object to be served, the total sum being £1,500, including lighting, hot water supply, etc. The architects were Messrs. Edward Boardman & Son, and the builders Messrs. J. Youngs & Son, Ltd., both of Norwich.



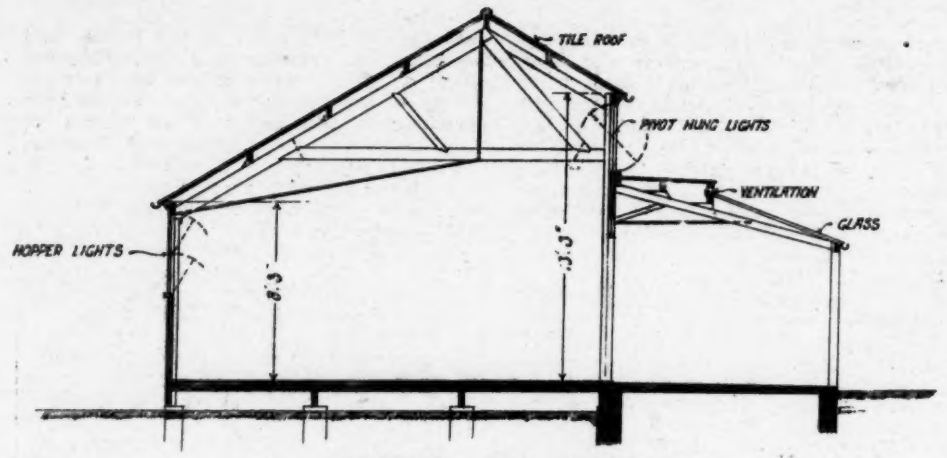
Soldiers' Wards, Norfolk and Norwich Hospital.
Messrs. E. Boardman & Son, Architects.

THE LATERAL PRESSURE AND RESISTANCE OF CLAY, AND THE SUPPORTING POWER OF CLAY FOUNDATIONS.

THE following is an abstract of a paper read at an ordinary meeting of the Institution of Civil Engineers recently by Mr. Arthur Langtry Bell, B.A., B.E., M.Inst.C.E.

The paper opens with a reference to the difficulty to be anticipated in attempting to estimate the lateral pressures and resistances of clay, its constitution and properties being obscure. It is pointed out that the engineer is not interested in the complex problems which attract the attention of the physicist, but would be content with a practical, simple, and sufficiently correct method of estimating the pressures and resistances exerted by clay, so far as these affect the design and stability of structures.

Published information is unfortunately insufficient to aid an engineer when confronted



SECTION OF WARD

Soldiers' Wards, Norfolk and Norwich Hospital.
Messrs. E. Boardman & Son, Architects. (*See page* 179.)

in practice with problems calling for a precise knowledge of the matter. He cannot hope to build a safe structure at the least cost unless he can make some reasonably accurate estimate of the forces with which he has to deal. Owing to reasons which appear later in the paper, the accepted theories of earth-pressure do not afford him much assistance.

There are two theories of earth pressure ordinarily used in English practice—Coulomb's and Rankine's. Both these theories apply to "a loose granular mass"—a definition which cannot possibly include undisturbed clay. Both also presuppose a knowledge of the angle of repose. The text-books in current use give angles of repose for clay varying from 1 deg. to 45 deg., and observation of the material itself is of little value when selecting the angle to be used for calculations. Widely different results will be obtained according to the angles chosen. The results of calculations by these methods are also found to be at variance with observed facts.

In the author's view the lack of agreement is due not so much to error in the existing theories as to a misapprehension as to the extent of their applicability. It is the purpose of the paper to bring before the members of the Institution an extension or modification of Rankine's theory which, when applied to clay, yields results more closely in accordance with fact and observation.

A short description is given of the monolith foundation work at Rosyth Dockyard, as it was in connection with this work that the investigation which forms the subject of the paper was made.

As the work of founding the monoliths proceeded, Rankine's formulas were duly applied to the different cases which arose, but in view of the doubt as to the applicability of the formulas to clay, and as to the correctness of the assumed angles of repose, the results were regarded rather as aids to practical judgment than as actual and reliable solutions of the problem of stability.

A search through all available records did not yield much information of value or furnish a theory of clay pressure. Practical experience with tunnels and embankments appeared to indicate that the pressures exerted by clay resembled those due to a heavy fluid. This view is supported by a quotation which is made from a previous contribution by the late Sir George H. Darwin. The search revealed a high percentage of failures in work constructed in clay.

The broad conclusions to which the investigation led were that there was no available theory of earth-pressure which, when applied to clay, would command the general confidence of engineers. There were no fixed rules for practice, and there were grave differences of opinion as to what intensities of pressure could safely be placed upon clay foundations. Experiments were undertaken with a view to throwing further light upon the question. The first experiments described were made in a small testing cylinder 8 in. in diameter, fitted with gauges at the ends and sides. The results are given of a few tests with this apparatus, but the author does not regard them as having much value.

Up to this point, following established custom, it had been thought that, however difficult it might be to find the true angle of repose for clay, it might be possible by experiment, or as the result of experience, to hit upon an angle which, when introduced into the generally recognised formulas, would give correct results. Suspicions were now felt that the root of the difficulty lay deeper, and that the true reason why Rankine's and Coulomb's theories were not applicable to clay was because clay did not conform to the law of resistance to shear which forms the initial basis of both those theories.

Rankine expresses the primary law upon which his theory is based in the following words:—"The resistance to displacement by sliding along a given plane in a loose granular mass is equal to the normal pressure exerted between the parts of the mass on either side of that plane multiplied by a specific constant."

The symbolical expression of this law is

$$q = p_n \mu = p_n \tan \phi,$$

p_n representing the intensity of normal pressure on the plane of shear, and q the intensity of resistance to shear on the same plane. μ the "specific constant" is equal to tan ϕ, ϕ being the angle of repose. If it could be shown that clay failed to comply with this primary condition, then it seemed clear that formulas deduced from this condition were inapplicable to clay.

To carry out the desired tests another apparatus was made, consisting essentially of a vertical cylinder 3 in. in diameter and about 10 in. high. Fitting into the upper end was a plunger which could be weighted on top, so as to compress the clay placed within the cylinder below it. Arrangements were made whereby the clay (while under pressure in a vertical direction) could be sheared through horizontally. The vertical load upon the clay and the pull required to shear through the clay being both known and capable of variation at will, it is possible with this apparatus, by making successive tests with different specimens of the same clay placed under varying degrees of compressive stress, to determine the law which governs the relation between the ultimate shearing resistances and the normal pressures on the planes of shear.

Experiments made with sand gave results closely in accordance with Rankine's law as stated above. It was found that no kind of clay complied with this law. According to Rankine's law, where there is no pressure there is no resistance to shear, but in all cases clay was found to resist shear where the pressure was zero. The rate of increase of shearing resistance with advancing pressure was found not to be so great as would be inferred from Rankine's law, adopting the angles of repose ordinarily current in practice.

It was found that when plotted in diagram form (with equal horizontal and vertical scales) the results with clay could be represented, with reasonable accuracy, by straight lines. These lines did not, however, pass through the origin (as would be the case in material complying with Rankine's law). In all cases they cut the vertical axis which passes through the origin at a distance k from the origin, and with advancing pressure the resistance to shear increased in proportion to an angle a, a being the inclination of the straight line to the horizontal axis.

Stated symbolically, the law to which clay conformed—so far as its shearing properties were concerned—was found to be

$$q = k + p_n \tan a$$

q representing the intensity of resistance to shear, p_n the intensity of normal pressure upon the plane of shear, and k the intensity of resistance to shear under zero pressure.

The law stated above becomes identical with Rankine's if k be taken as zero and a as the angle of repose.

To make clear the state of stress and of resistance within a body subjected to external pressure, curves are shown illustrating the intensities of stress and resistance in sand and in clay. From these diagrams and by a simple mathematical proof it is shown where the plane of rupture occurs both in sand and in clay. The position of the plane of rupture ascertained in this manner is found (in the case of sand) to be identical with that deduced in a different way by Coulomb.

Having determined the position of the plane of rupture in clay, the author next proceeds, by considering the equilibrium of minute masses of clay in contact with the wall, to deduce formulas for the pressure and resistance of clay. The deduced formulas are then compared with Rankine's in the table given below:—

These formulas suffice for the design of retaining walls in clay, the surfaces being assumed horizontal: the paper is limited to the consideration of this case only.

If k be taken as zero and a equal to ϕ, the new formulas (with one exception) become identical with Rankine's. The exception referred to (namely, the minimum permissible intensity upon a foundation) is then discussed, and reasons are given for adopting the newer formula. It is also pointed out that there is another essentially practical reason for the final abandonment of the value wH; namely, that, by what appears to be the general consent of engineers, it has, in fact, been already abandoned. It is questionable whether any large retaining-wall has been built in accordance with it.

It was thought desirable to supplement the theoretical work by making direct observations of pressure within a large mass of clay. The four diaphragm gauges used in the previous

	Rankine.	The Author.
p_1 = intensity of active pressure on back of wall at any depth h	$w h \left(\frac{1 - \sin \phi}{1 + \sin \phi}\right)$	$w h \tan^2 \left(\frac{\pi}{4} - \frac{a}{2}\right) - 2k \tan \left(\frac{\pi}{4} - \frac{a}{2}\right)$
r_1 = maximum intensity of horizontal resistance of material in front of a wall at any depth d	$w d \left(\frac{1 + \sin \phi}{1 - \sin \phi}\right)$	$w d \tan^2 \left(\frac{\pi}{4} + \frac{a}{2}\right) + 2k \tan \left(\frac{\pi}{4} + \frac{a}{2}\right)$
r_2 = minimum permissible intensity of downward pressure on foundation at heel of wall (depth H)	w H	w H $\tan^4 \left(\frac{\pi}{4} - \frac{a}{2}\right) - 2k \tan^2 \left(\frac{\pi}{4} - \frac{a}{2}\right) - 2k \tan \left(\frac{\pi}{4} - \frac{a}{2}\right)$
r_2 = maximum permissible intensity of downward pressure on foundation at toe of wall (depth D)	w D $\left(\frac{1 + \sin \phi}{1 - \sin \phi}\right)^2$	w D $\tan^4 \left(\frac{\pi}{4} + \frac{a}{2}\right) + 2k \tan^3 \left(\frac{\pi}{4} + \frac{a}{2}\right) + 2k \tan \left(\frac{\pi}{4} + \frac{a}{2}\right)$

cylinder tests were built into the side of one of the monoliths, being arranged in two pairs. The gauges of the lower pair were fixed side by side at a height of 10 ft. above the cutting edge of the monolith shoe, while directly above them, and 12 ft. 8 in. higher up, were the two remaining gauges. By adopting this arrangement it was intended that each gauge-reading should constitute a check upon the reading of that beside it; while the readings of the lower pair at any depth would be checked at a later date by those of the upper pair when the latter reached the same point.

The actual uncorrected readings of all four gauges, taken from time to time as opportunities offered during sinking, are shown by diagrams together with a section of the strata through which the monolith was sunk.

Unfortunately one pair of gauges was spoiled by leakage, and owing to damage by blasting the records obtained from the other pair were insufficient to confirm completely the theoretical conclusions previously obtained. But so far as the records went they appeared to be in reasonable conformity with the theoretical position discussed in the paper.

The laying of too much stress upon the few readings obtained is deprecated, and the practicability of making effective use of the new formulas is discussed. It is pointed out that it is not easy when designs are in progress to obtain clay in its virgin state and from considerable depths below the surface for the purpose of making tests; and in certain methods of construction—the sinking of monoliths, for example—the strata are often never seen in their normal condition, even when the works are in progress. Further, the building of a new work may have, in the course of years, the effect of altering the condition of the strata which press upon the structure. What the extent of these changes will be, and whether they will be beneficial to stability or otherwise, will never be determinable by purely mathematical methods. If reasonably correct results are to be obtained, some measure of judgment must lend its aid towards the solution of the real problems of earth-pressure which occur in practice, as distinguished from the simplified and somewhat unreal problems with which theorists necessarily deal.

The paper concludes with the usual formal acknowledgments, and a tabular statement of average values of k and a, so far as present experience goes. The appendices include an independent proof by Professor Maurice F. Fitzgerald yielding results identical with those obtained by the author by different methods.

THE CONCRETE INSTITUTE:

"THE APPLICATION OF CONCRETE IN MODERN SANITATION."

At the meeting of the Concrete Institute on January 7 a paper was read by Mr. Henry J. Tingle, M.Inst.C.E., M.C.I., on "The Application of Concrete in Modern Sanitation," from which we take the following extracts:—

Concrete has played its part in sanitation for many years, with more or less success, according to the skill of the designer and the quality of the materials and workmanship. The tendency in recent years has been to employ concrete more and more, and this tendency in the future is certain to extend its use in directions where now it is scarcely applied. Therefore it is not surprising that the Secretary of the Institute should desire recognition to be given to the claims of concrete in connection with sanitation, however much his judgment may be at fault in his selection of the author of the paper. The President of the Institute, in his address at the opening meeting of this session, states: "The Local Government Board are responsible for retarding the progress of reinforced concrete to a very great extent."

There is no doubt that sanitation works have been peculiarly affected by the attitude of the Board towards reinforced concrete, as such works are generally undertaken by local authorities, who have to obtain the sanction of the Board to the raising of a loan for the amount of capital expenditure, or else to obtain Parliamentary powers by means of a private Act. The great majority of authorities, however, adopt the first of these two courses of procedure, and the practice of the Board is, in the case of reinforced concrete for works in contact with water or sewage, to require the capital sum to be paid off in a period of ten years, whilst in the case of ordinary concrete, under the same conditions, the period of repayment is thirty years. In cases where in addition to reinforced concrete in contact with water there is reinforced concrete not in contact with water the periods for the loans on each class are sometimes equated together, and the loan for the whole granted for the period given by the equation.

Doubtless in the early years of reinforced concrete the Board were well advised to act cautiously in the matter of sanctioning loans for the use of a combination of materials of which, in this country, there had been scarcely any experience, either as to its suitability or as to its life in sanitation works. The effect of this differentiation on the part of the Board in the treatment of concrete, and of reinforced concrete, has been to curtail the employment of the latter in public works of sanitation. It is clear that under the present conditions, where a loan is obtained for reinforced concrete, the burden thrown on the ratepayers annually to repay the principal and interest in equal annual instalments spread over ten years would be more than twice as great as for a loan of equal amount and rate of interest obtained for ordinary concrete, to be repaid in equal annual instalments in thirty years. The following example will illustrate the matter. If £1,000 be borrowed at 3¾ per cent. interest to be repaid in equal half-yearly instalments of principal and interest for terms of—

	£ s. d.
10 years: the amount to be paid each half-year	60 8 6
30 years: " " " "	27 18 1

the difference between these two amounts is approximately £32 10s., which is 116 per cent. of £28.

Under these circumstances it is only natural that most authorities elect to use ordinary concrete in order to ease the burden of the present ratepayers and throw part of it upon the ratepayers of the future.

The effect of the differentiation amounts to this, that unless the cost of the works can be considerably reduced by the employment of reinforced concrete as compared to ordinary concrete there is but little probability of local authorities deciding in favour of the former. The requisite saving may be effected in some instances, but so far as the experience of the author goes this is not generally the case.

With the experience that has now been acquired relating to the behaviour of reinforced concrete that is constantly in contact either with water or with sewage it is permissible to hope that the time is not far distant when the Local Government Board will reconsider its attitude towards this material, and in cases where it is proposed to make use of it will sanction loans on more favourable terms as to the period of repayment than those now in force.

It is generally agreed that concrete should be machine-mixed. On the other hand it cannot be denied that very good work has been done in the past with concrete hand-mixed, and with the cement calcined in the old type of kiln, and not nearly so finely ground as is the case at present.

In many instances sanitation works are constructed for small populations. Such works are necessarily not extensive, the quantity of concrete required being limited, and a considerable proportion of the whole being laid in thin layers under pipes and manholes along miles of streets. These conditions militate against the use of machine mixers, and the mixing is done by hand, usually by ordinary labourers, necessitating most careful supervision on the part of the inspector.

In the construction of reservoirs and sewage disposal works for larger populations machine mixers are frequently used. They are now being employed by Mr. S. S. Grimley, M.Inst.C.E., at Hendon, on the extension of the local Council's sewage disposal works, the quantity of concrete being 10,000 cubic yards.

Concrete has been and now is extensively employed in the construction of reservoirs, sewage tanks, filters, aqueducts, and water towers. Full descriptions of these works are to be found in the technical journals and volumes of proceedings of the various engineering societies. The same holds good for similar structures in reinforced concrete, though to a more limited extent, but numerous examples are given in the catalogues issued by the various firms specialising in this class of work.

Mass concrete has been largely used in the construction of sewers of 4 ft. diameter and upwards. It is moulded in the trench, and supported by centering until set. Elliptical sewers are also constructed in this manner. In recent years reinforced concrete has been employed for sewers of both types, the mixture being sufficiently stiff to admit of ramming. Concrete tubes have been extensively employed in main sewerage work for many years past, being supplied ready for use by firms who have taken up their manufacture.

Concrete tubes, unless strongly reinforced, should be laid on a concrete bed not less than 6 in. in thickness, and the concrete be brought up round the tube as far as the springing. By the omission of this precaution many failures have occurred. In tubes liable to internal pressure the concrete should entirely surround them.

Concrete tubes used as sewers may suffer damage from liquids being discharged into them at high temperatures, also by the discharge of acids. Instances have been recorded where concrete has perished when in contact with sewage. A paper was read by Mr. Sidney H. Chambers before this Institute in April, 1910, describing the disintegratory changes in the concrete of the sewage tanks and conduits that occurred at Hampton. To ascertain if concrete tubes would be affected he caused a couple of 9-in. tubes to be placed in the tank for a period of eight months. One was coated with Dr. Angus Smith's composition. The coated tube was not affected. The uncoated tube was attacked over the area that was immersed in the sewage at high level, but which was not in contact therewith at low level. He does not state whether the uncoated tube had been, on removal from the moulds, dipped in a bath of solution of silicate of soda.

In the great majority of cases concrete suffers no damage by contact with sewage. Still, under certain conditions the lime in the cement may be attacked, and, as far as is possible, precautions should be taken to prevent such conditions arising. Further investigation is needed to ascertain why concrete occasionally disintegrates when in contact with sewage.

The following instances within the author's experience were given as illustrating, in greater detail, the application of concrete to sanitation works:—

Failure and reconstruction of concrete-covered reservoir.

Temperature cracks in concrete reservoir wall.

Ejector chamber in concrete with steel-plate lining.

Concrete mole forming sewage outfall into sea.

Circular hydrolytic tanks in reinforced concrete.

STANDARDISATION OF PIPE FLANGES AND FLANGED FITTINGS.*

The standardisation of pipe flanges and of flanged fittings is a matter of great importance to both manufacturers and users, and it has during recent years received much attention in this and other countries. On April 18, 1902, Mr. Robert E. Atkinson, of Leicester, read before the Institution a paper in which he dealt in a most thorough and painstaking way with the position of the subject at that date. Largely as a result of Mr. Atkinson's paper, and of the valuable discussion to which it gave rise, the matter was, in the following year, taken up by the Engineering Standards Committee, who appointed a Sectional Committee on Pipe Flanges to deal with the question. This Committee held its first meeting on June 30, 1903, and from it there was formed a smaller sub-committee, entrusted with the task of studying details and carrying out any experiments which might be necessary.

The sectional committee and sub-committee held in all thirty meetings, at which they received and discussed a great mass of information relating to existing practice, and also the data derived from various experiments carried out in the course of the inquiry. As a result, they embodied their conclusions in a Report† in which the flanges, etc., are standardised in four classes, viz.:—(1) Low-pressure standard, for steam pressures up to 55 lb. and water pressures up to 200 lb. per square inch; (2) intermediate pressure standard, for steam

* Part of a paper by Mr. John Dewrance read before a recent meeting of the Institution of Mechanical Engineers.

† British Standard Tables of Pipe Flanges, No. 10, November, 1904.

pressures over 55 lb. but not exceeding 125 lb. per square inch; (3) high-pressure standard, for steam pressures over 125 lb. but not exceeding 225 lb. per square inch; and (4) extra high-pressure standard, for steam pressures exceeding 225 lb. but not exceeding 325 lb. per square inch. The Report also gives standard dimensions for short bends and tees of cast metal and for long bends of wrought-iron and steel.

Diameters of Flanges and Bolt-Hole Circles.—In the British Standard Tables of Pipe Flanges the diameters of flanges and bolt-hole circles are uniform for all flanges intended for steam pressures ranging from 55 lb. to 325 lb. per square inch, slightly smaller flanges, however, being given for the low-pressure flanges forming Class I, and intended for steam pressures up to 55 lb. per square inch. The diameters of bolt circles decided upon were the smallest permissible in the case of cast fittings, after making due allowance for the fillet at the root of the flange and without resorting to pin drilling to secure a flat bearing face for the units.

Number of Bolts.—One of the most important points that came before the sub-committee for decision was, whether or not the number of bolts employed should in all cases be a multiple of four, and a great deal of discussion occurred before a conclusion was arrived at. Careful consideration was given to standards in which the number of bolts increased one at a time, and others where the number increased two at a time, and the opinions of a great number of engineers were asked and considered.

The conclusion arrived at by the sub-committee was that there can practically be no standard at all unless the numbers of bolts are multiples of four.

The sizes of the bolts were calculated throughout to allow an ample margin of safety, assuming that, in the case of a joint on the point of leaking, the full pressure might be exerted on the area of a circle just touching the inside of the bolt holes.

The clearance of $\frac{1}{16}$ in. in the bolt holes for $\frac{1}{2}$ in. and $\frac{5}{8}$ in. bolts, and of $\frac{1}{8}$ in. for larger sizes, was, in the opinion of the sub-committee, the smallest allowance that was practicable for commercial manufacture.

Thickness of Flanges.—A considerable amount of the time occupied by the sub-committee was given to the consideration of the thickness of flanges. Many theories as to the formulæ put forward on this subject were considered, but the sub-committee did not agree as to any formula that could be accepted for general use.

The thicknesses of the flanges embodied in the standard Tables were arrived at by the sub-committee as the result of actual experiments conducted for them. These experimental flanges were jointed with red-lead paint and baked for twenty-four hours above steam heat; they were then tested till they leaked, and the thickness adopted in all cases showed a satisfactory margin of strength. The sub-committee, however, did not provide for test pressures more than 100 lb. in excess of the working pressures, and if greater test pressures of the complete pipe-lines were required the thickness of the flanges would have to be increased. Hydraulic tests of individual units can, however, be made, with temporary elastic packings, to test the soundness of the material.

Jointing Material.—The sub-committee did not make any recommendations as to packings, though they discussed these. The author would, however, like to point out that the strength of a flange is much greater if the packings extend over the whole face. Packings that only extend over the surface inside the bolts throw an unnecessary stress on the flange and tend to cup it and cause it to break away from the pipe.

THE RECONSTRUCTION OF BELGIAN BUILDINGS.

On February 11 a conference was held at the Guildhall, initiated by the International Town Planning Council, and presided over by a Belgian Minister, Mr. Helleputte. There was a large attendance of Belgian architects, engineers, and contractors.

Several Reports were read and a number of speeches made dealing with the steps which might be taken in preparation for the work of reconstruction which will have to be taken in hand as soon as Belgium is disembarrassed of the enemy.

It was particularly interesting to be told that a Royal Commission, instituted by the Belgian Government, is studying the devastated towns, and marking on a map the properties which have suffered injury, dividing them into three classes—those slightly damaged, those partially destroyed, and those wholly destroyed; and that steps are being taken to ascertain the valuation of the cost of restoration with a view to the formulation of a demand for indemnity when the time comes, and of providing a basis for estimating the money required for reconstruction.

The damage that has been done divides itself into three types, viz.:—damage to rural properties, damage to industrial districts, and damage to urban districts. From the discussion it appeared that to prevent hasty and ill-advised reconstruction, and to prevent undue crowding when the refugees return, it would be necessary to provide for temporary shelters to be constructed of the cheapest and readiest materials available, which would give time for proper measures to be taken for the permanent reconstruction.

It was evident that it would be undesirable to reconstruct, as before, dwellings which did not provide accommodation in accordance with modern requirements in respect of light, air, sanitation, and area of open space, and that, for industrial districts especially, this would involve careful consideration and the application of the principles of town planning. It was also evident that the central government ought to have a voice in all matters affecting ways of communication, railway restoration and the restoration of public buildings.

A note of warning was sounded as to the danger of a too centralised control, however, as leading to a drab uniformity of treatment of this problem, and that, while it was undoubtedly desirable that certain principles should be generally observed, there ought to be the fullest latitude left to localities to exercise their own judgment as to the design and type of building which should replace those destroyed.

It was suggested that Belgian architects and engineers, while awaiting here the possibility of being able to return to their own country, might devote their enforced leisure to the preparation of plans of a typical character suitable for use hereafter in the work of restoration, and that the opportunities now being afforded them, by the enterprise of the International Town Planning Council, would enable them to assimilate ideas and information here which they could adapt to the needs of their own country and to the habits of their own people. It was announced later that arrangements were being made for facilities to be afforded for this purpose at the London University, where an exhibition of plans and models, and an atelier, would be placed at the disposal of those interested.

The proceedings on the first day were adjourned until the 15th; meanwhile excursions were made to Letchworth and Golders Green, and addresses were given at those places bearing on the works examined. On the resumption of the conference at the Guildhall, papers were contributed dealing with the existing laws and regulations normally in force in Belgium for controlling the development of buildings and ways of communication. In the main it appeared that these ran on somewhat similar lines to those with which we are familiar in this country.

Local autonomy prevails subject to a certain amount of control by the provincial and central Governments. It appeared, however, that the latter were able to exercise rather more control, especially as regards ways of communication, than appears to be the case here.

The weak point of the control in regard to hygienic conditions was said to lie in the fact that the law is permissive and not mandatory, with the usual result that in communities where the appreciation of the advantages of hygienic conditions is not well developed little or nothing is done in that direction.

As showing how extensively Town Planning is engaging the attention of public authorities throughout Europe, one of the reports mentioned that laws dealing with this question exist in Sweden, Italy, Germany, and England, and gave a résumé of their purport and progress. The Swedish law goes back to 1734. Italy has a Town Planning Act dating from 1865.

On the whole the proceedings were of a very interesting and instructive character, tending to define pretty clearly the extent and nature of the problem; and the International Town Planning Council, and those kindred bodies which helped it so cordially, are to be congratulated on the effort made and the steps taken to facilitate a solution likely to render a permanent service to the Belgian nation.

CONSTRUCTION NOTES.

Why Cast Iron cannot be Cut by Oxygen.

In metal-cutting by oxygen the melting point of the metal should not be reached. The successful employment of oxygen for this purpose depends on the melting point of the oxide being lower than that of the metal. In the case of wrought iron and mild steel the melting point of the metallic oxide, which is formed by means of the heating flame combined with the oxygen jet, is much lower than the melting point of the metal. The process of cutting, therefore, consists in this oxide being continually formed and at the same time blown away by the oxygen mainly in the form of particles of metallic oxide, thereby constantly exposing fresh metal surfaces to a similar reaction. Thus a clean narrow cut is effected corresponding approximately to the width of the oxygen jet and the pressure behind it. The metal on each side of the cut is neither melted nor injured in any way, as the reaction proceeds too rapidly for the heat to spread. In the case of cast iron, unfortunately (from the point of view of metal cutting) the melting point of the metal is lower than that of the oxide. Consequently, the proper reaction cannot take place, and instead of a clean cut being effected by the discharge of oxide, as in the case of wrought iron and steel, a wide and irregular opening is formed, with the edges of the metal broken down, whilst a heavy stream consisting mainly of molten iron is discharged. For the same reason, many highly carbonised steels with relatively low melting points cannot be satisfactorily cut by means of a jet of oxygen. Owners of metal-cutting blowpipes should realise that this most valuable tool has its clear limitations and at present can only be advantageously used for cutting wrought iron and steel. (From the "Proceedings" of the British Acetylene and Welding Association.)

Lists of British Standard Rolled Sections.*

The revised Lists of British Standard Rolled Sections has just been issued by the Engineering Standards Committee, and these supersede the Lists published in 1903. It has been found possible to delete one section only, viz.—the 6½ in. by 4 in. unequal angle, as it is found that sections which have been discarded in one class of building or ship work are now utilised in another. Certain additions have been made to the lists in the form of four unequal angles, three bulb angles, and two Zed bars, all of which are in demand primarily for shipbuilding purposes. Certain reductions have been made in the minimum web thicknesses of the bulb angles and channels with a view of producing more economical forms of sections. The Lists are prepared and presented in the admirable manner which is always associated with the work of the Engineering Standards Committee, and they should be acquired by all those connected with structural work.

BUSINESS PREMISES, HATTON GARDEN, E.C.

A commercial building, the ground floor of which will be utilised as a post-office, is in course of erection in Hatton Garden, Holborn-circus, E.C. The site was cleared by Messrs. Coker & Co., Ltd., Dalston. The architect for the new building is Mr. Joseph Sawyer, F.R.I.B.A., Gamage-building, Holborn, E.C. The general contractors are Messrs. Higgs & Hill, Ltd., Crown Works, South Lambeth-road, S.W., and the steelwork is by Messrs. Drew-Bear, Perks, & Co., Ltd., Battersea, S.W. The sanitary fittings are by Messrs. J. Tylor & Sons, Ltd., Tottenham Court-road, W.; the floors are by Messrs. the Frame Floor and Fireproof Construction Company, Victoria-street, Westminster; the granite is by Messrs. Fenning & Co., Palace Wharf, Hammersmith, W.; the carving is by Mr. C. H. Mabey, Vauxhall Bridge-road, S.W.; the lantern lights are by Messrs. Hayward Brothers & Eckstein, Ltd., Union-street, Borough, S.E.; and the lifts will be installed by Messrs. Waygood-Otis, Ltd., Falmouth-road, S.E.

* Published for the Engineering Standards Committee by Crosby Lockwood & Son. Price 2s. net.

THE BUILDING TRADE.

GERMAN INDUSTRIAL METHODS.

UNDER this title Sir William Ramsay, K.C.B., F.R.S., in an address to the annual meeting of the Employers' Parliamentary Association—an organisation presided over by Sir Charles W. Macara, Bart., with headquarters at Manchester—called attention to the necessity for us to realise that Germany's methods in trade have been, and are, as far as possible identical with her methods in war. These last, we are learning, are characterised by an utter lack of conscience or sense of honour or sportsmanship, the natural product of their incredible self-sufficiency, which, according to the judgment of a distinguished Swiss, made it seem so natural to them to grab the belongings of others that they did not understand that one had some wish to defend himself.

Sir William Ramsay points out that under the German State there was, as far back as 1903, a trade Council the object of which was to secure and keep trade for Germany. This Council had practical control of duties, bounties and freights; its members were representative of the different commercial interests of the Empire; and they acted, as a rule, without control from the Reichstag. An example is given of how this organisation set to work to undermine and then destroy a profitable monopoly in a chemical product which a certain English firm had. It was not a patented article, but one for which the firm had discovered a good process of manufacture. An attack was made on its Liverpool business first by reducing the freight on this particular article from Hamburg to Liverpool.

The firm tried to meet the competition by introducing economies, and continued to do so for a time. A year later the German manufacturers lowered the price so far that the English firm could not sell without making a dead loss. It transpired that the lowering of price was due to a heavy export bounty being paid to the German manufacturers by the German State.

It is the bringing of the heavy machinery of the State to bear on the minutiæ of commerce which makes it impossible for private enterprise to compete with such methods. One article after another is attacked as opportunity offers; British manufacture is killed, and Germany acquires a monopoly. No trade is safe. And the result of such successes which have been obtained in most of the markets of the world has been to convince the German nation that Great Britain is a decadent nation, no longer worthy of the proud position she occupies, rotten to the core, and only needing a good push to hurl to destruction. Hence the struggle we are now engaged in. Truly, great events from trivial causes spring.

And the moral to be learnt by this nation now is that when the war is over German trade methods must be broken as German military power must be broken, or the game will commence all over again.

Sir William Ramsay says these methods apply not only to business or manufacture, but to shipping as well. Our shipping companies, in good faith, have associated themselves with others in "conferences," apparently for the mutual advantage of all, forgetting that behind the German companies lay the powerful mass of the German State. Tramp steamers, and, with them, cheap freights to the East, have been eliminated.

The Royal Commission on shipping rings which met some years ago, referring to the system obtaining in Germany and fostered by the German Government, of charging through rates on goods from towns in the interior to the port of destination, observed in its Report: "Such rates constitute a direct subsidy to the export trade of German manufacturers, and an indirect subsidy to those German lines by whom alone they are available."

We have previously called attention to the need there is for our manufacturers, exporters and freight carriers to so correlate their arrangements that the lowest possible prices could be quoted in the destination markets, but evidently something more is likely to be required to offset the subsidising practices of the German Government, and that will be a matter for the State. Either such practices must be rendered impossible in the future, or they must be countered by appropriate State aid here.

At the recent meeting of the National Federation of Building Trade Employers a communication was considered from the British Engineers' Association asking for co-operation in formulating and bringing to the notice of the Government a proposal for the establishment of a board of Industry, representative of the great industries of the country, and presided over by a man of great business ability permanently in office and with the rank of a Cabinet Minister. The main business of the department thus suggested would be to enable the State to take all practicable steps to help the industries and thereby increase the trade of the country, as the present State help extended to our foreign trade is quite inadequate. The proposal is based upon the statement which will find ready acceptance, that the greatness of England lies in her trade, and her trade depends upon her industries. And the author of the suggestion urges that, "Just as we have an Army and Navy to defend our country, so we should have bodies of trained men all over the world to defend our trade."

PROPOSED NEW BUILDINGS AND OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; L.G.B. for Local Government Board; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

ABERDEEN.—The Water Committee are recommending that a Bill be promoted in Parliament for a new scheme from the River Dee at a cost of £450,000 for a supply of 10,000,000 gallons daily. The scheme includes a new aqueduct, storage, and settling reservoirs, and liming and filtration plant.

Abertillery.—An inquiry has been held by the L.G.B. into the application of the R.R.C. to borrow £32,657 for the erection of dwellings at Rose Heyworth and Aberbeeg. The scheme is to provide for the erection of 122 houses—102 on the Rose Heyworth site and twenty in Aberbeeg.

Accrington.—Mr. Richard Stewart, builder and contractor, of Accrington, is applying for a provisional licence for kinematograph exhibitions for a hall to be erected at the corner of Peel-street and Abbey-street. The hall is to seat 840.

Atherstone.—The R.D.C. have decided to erect twelve working-class dwellings on the Innage Close land.

Bangor.—Plans of four cottages proposed to be erected at Minafon by Mr. Wm. Parry have been approved.

Bexhill.—Plans passed for Mr. J. E. Maynard for Mr. L. Manning for a detached house in Sutherland-avenue.

Birmingham.—A L.G.B. inquiry has been held into the application of the T.C. for sanction to borrow £4,460 and £4,100 for works of sewerage at Erdington and Acock's Green respectively.

Bournville.—There is a scheme for erecting a church at Bournville, and ultimately creating the model village a separate ecclesiastical parish out of Selly Oak and King's Norton.

Bridgwater.—The B.G. have agreed to proceed with the work of providing a new boiler-house and stack at the Workhouse at an estimated cost of £950. The L.G.B. have consented to an expenditure of £250 for providing emergency staircases, and the Board have decided to proceed with this work.

Bristol.—The Docks Committee have accepted the tenders of Messrs. W. Cowlin & Son for the construction of a ferro-concrete tobacco warehouse, Clift House site, and the Railway and General Engineering Company for a built-up stock block. The T.C. have granted a lease of a piece of land at Anchor-road to Mr. F. C. Burgess in consideration of buildings of not less value than £5,000 being erected on the land.

Carlisle.—The T.C. have agreed to provide a technical school for the city upon a site to be afterwards decided upon.

Chesterfield.—The plans of the proposed new church of St. Augustine, to be erected in Derby-road, Chesterfield, have been approved by the T.C. The Chesterfield Corporation's surplus land in Infirmary-road has been inspected with respect to its eligibility for dwellings under the Housing of Working Classes Act. The erection of the miners' rescue and fire-station and staff quarters in Infirmary-road will be commenced forthwith, the plans having been passed by the Corporation.

Congleton.—Plans for two cottage homes to be erected at Sandbach Heath, submitted by the architect, Mr. Price, have been approved by the B.G.

Cornwall.—The C.C. have applied for the raising of the following loans for elementary education:—New schools—St. Ives, £4,776; Copperhouse, £7,160; Polkerris, £1,026. Additions—Ludgvan, £644; Mithian, £146; St. Columb Minor, £309; Biscovey, £108. Master's house—Otterham, £367. Handicraft centre—Wadebridge, £750.

Darlington.—Plans passed by R.D.C.:—Estate plan at Fighting Cocks for Mr. Dougill; conversion of the mill house at Fighting Cocks into two houses; cottage for Mr. Joseph Vart at Coniscliffe. The T.C. have decided that application be made to the L.G.B. for sanction to borow £18,550, being the estimated amount required to carry out the proposed extensions at the Electricity Works, and £2,580, the estimated cost of the proposed extensions to the Gurney Pease Memorial School. The T.C. have passed the following plans:—Mr. J. E. Chilton, back street south side of Melland-street, and two houses, Pierremont-road; Messrs. Kitching & Lee, new road, Linden-avenue; Messrs. G. Dickinson & Son, aerated-water factory, warehouse, and store, north side of Haughton-road, and two houses, St. Andrew-street; Messrs. Clark & Moscrop, Sunday-school, Marshall-street; Mr. J. W. Watson, fifteen houses, Walton-street.

Dunfermline.—The School Board have decided to erect a new school in Crossgates capable of accommodating 640 pupils. The new building will possess several features new to the schools under the Board, including a spray bath, a gymnasium, and medical inspection rooms.

Glasgow.—The Dean of Guild Court have granted linings to the School Board of Glasgow to erect a shooting range on the west side of Holland-street; to Messrs. Edgar & Crerar, Ltd., to make alterations on and additions to premises at 167, Adelphi-street; and to the Glasgow Juvenile Delinquency Board to alter and erect buildings at Maryhill.

Harrogate.—Plans passed:—Mr. J. E. Naismith's tool and storehouse, Belgrave-crescent; Mr. A. Chippendale's new back road and sewer, rear of Chestnut-avenue, off Regent-street.

Hinckley.—Plans passed by the U.D.C.:—New billiard saloon, Station-road, for Messrs. Willie Holt & Co., of Birmingham; new kitchens to property in Derby-road for Mr. W. H. Payne; and house and workshop, Upper Bond-street, for Mr. A. Jeffcote.

Holmfirth.—The L.G.B. have sanctioned the U.D.C. borrowing £3,591 for building in connection with the electric-lighting scheme.

Huntingdon.—The R.D.C. have decided that plans for four cottages at Upwood be prepared.

Ilford.—The Stratford justices have given permission for the rebuilding of the "Dick Turpin," Aldborough Hatch, Ilford, for Mr. E. E. Perkins.

Ince.—The U.D.C. have received a communication from the L.G.B. transmitting sanctions to the borrowing of the following sums in connection with the new sewage scheme, viz., £15,670 (for thirty years), £1,530 (for fifteen years), £500 (for twenty-one years).

Kenmare.—A L.G.B. inquiry into an application by the R.D.C. for £4,000 for the provision of a water supply for the town has been held.

Kingstown.—The L.G.B. have held an inquiry into the application of the U.D.C. for a Provisional Order for the widening of Dunlearyhill, and a loan of £2,115 4s. for the work.

Leyland.—Store-rooms in Stannington-street for Messrs. W. Barrow & Son.

Loughborough.—Inquiry has been made by the L.G.B. into the application of the T.C. to borrow £5,806 for the purposes of building a new fire-engine station and depôt in the Rushes.

Manchester.—An inquiry has been held by the L.G.B. respecting the City Council's application for sanction to borrow £60,000 for works of sewerage in the city area, and £1,775 for the purchase of property in the township of Flixton adjoining the Davyhulme sewage disposal works.

Mansfield Woodhouse.—Alterations to shop and premises in High-street for Mr. E. T. Rouse.

Nelson.—Plans passed for sixteen houses in Railway and Oxford streets for Mr. A. Moore.

New South Wales.—Mr. Holman, the New South Wales Premier, has stated in the Legislative Assembly that an agreement has been made between the New South Wales Government and the engineering firm of Messrs. Norton, Griffiths, & Co., Ltd., for contracts involving an expenditure of £10,000,000. Of this, £4,000,000 is to be expended in the first year, principally on important country works and on the city railway.

Newton Abbot.—A L.G.B. inquiry has been held relative to the application of the R.D.C. for sanction to borrow £3,100 for an additional water supply from Yarner for the parish.

Oystermouth.—Plans approved for two cottages on land abutting on West Cross-lane for Mr. Taylor Norton.

Plymouth.—The T.C. have approved the proposed extension of the Borough Lunatic Asylum at Blackadon to accommodate 440 additional patients, and that Messrs. Thornely, Rooke, &

* See also our list of Competitions, Contracts, etc., on page 186.

RATES OF WAGES IN THE BUILDING TRADE.

THE following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur :—

——	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons' Labourers.	Bricklayers' Labourers.	Plasterers' Labourers.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Aberdare	9	—	9½	9½	—	9	8	6½	6½	6½
Accrington	10	9½	9½	9½	9	9	9½	6½	6½	6½
Altrincham	9½	10	10½	10	8½	10	9	6½	6½	6½
Ashton-under-Lyne	10½	10½	10	10½	9	10	9	6	6	7
Barnsley	9½	9½	9½	9½	9	9	8½	7	7	7
Barrow-in-Furness..	9½	10	9½	9½	9½	9½	8½	7	7	7
Barry	9½	9½	9½	10	—	9	8½	6½	6½	6½
Bath	8½	8½	8½	8	7½	8	7½	5½	5½	5½
Bedford	8	8	8	8½	8	9	6½	5	5	5½
Birkenhead	11	11	11	11½	11	11	9½	7	7	7
Birmingham	10½	10½	10½	10½	9½	10½	9½	7½	7½	7½
Bishop Auckland..	9	9	9	9	10	9	7½	6	6	6½
Blackburn	10	10½	10	9½	9½	10	9½	6½	7	7
Blackpool	10½	9½	9½	9½	8½	9	8½	6	6	6
Bolton	10	10½	10	10½	9½	10	9½	6-7	6-7	6 7
Bournemouth	8½	8½	8½	8½	8½	8½	8	6	6	6
Bradford	10	10	9½	9½	9½	10	8½	7	7	7
Bridgwater	6½	6½	6½	6½	6½	6½	6	4	4	4
Brighton	9	8½	8½	8½	—	8	7	6	6	6
Bristol	10	10½	10½	10	—	10	9½	7½	7½	7½
Burnley	10	9½	9½	9½	8	9	9½	7	7	7
Burton-on-Trent	9	9	9	9	8½	9	8½	6½	6½	6½
Bury	10½	10½	10	9	9½	10	9	6	6	6
Cambridge	9½	9	9	9½	9½	9½	7½	6	6	6
Canterbury	8½	8	8	10	—	8½-9	6½	5	5	5
Cardiff	9½	9½	9½	9½	9½	9½	8½	7	7	7
Chatham	8	9	9	9	9	9	7	6	6	6
Chelmsford	8	7½	8½	9	—	7½	6½	5	5	6½
Cheltenham	8½	8½	8½	8½	—	8½	8	6	6	6
Chester	9½	10	9½	9½	9½	9½	8½	5½	6½-6½	5-5½
Chesterfield	9	9	9	8	9	8½	8½	5½	5½	5½
Colchester	8	8½	8½	9	8	9	6	5½	5½	5½
Coventry	10½	10½	10½	10½	9½	10½	8½	7½	7½	7½
Crewe	7	8	7½	9	8	8	7½	5	5½	6
Darlington	9½	9½	9	10	10	9	8½	6½	6½	6½
Derby	9½	9½	9	9	9	9	8	6½	6½	7
Doncaster	9½	9½	9	9	9	9	8	6½	6½	7
Dudley	8½	8½	8½	8½	8½	8	7½	5½	5½	5½
Durham	9	9	9½	9	10	9	8½	6	6	6½
East Glamorgan and Monmouthshire Valleys	9½	9½	9½	9½	—	—	8½	6½	6½	6½
Exeter	8	8½	8	8½	7½	7½	7	5½	5½	5½
Folkestone	8½	8½	8½	9	8½	8½	7-7½	6½	6½	6½
Gloucester	8	8½	8½	8	8	8½	8	6	6	6
Grantham	8	8	7½	7½-8	7½-8	7	6½	5	5	5
Grays	—	10	10	—	—	9½	8½	7	7	7
Grimsby	9	9	9	9	9	8	8½	7	7	7
Great Yarmouth	8	8	8	—	8	8	6½	5	5	—
Halifax	10	10	9	8½	8½	9	8½	7	7	7
Harrogate	9½	9½	9	9	8	9	8½	6½	6½	6½
Hartlepools	9	10	9½	10	10	10	9	7	7	7½
Hastings	8½	8	8	8½	8	8	7	6½	5½	6½
Hereford	8	8	7½	8½	8	7	6½	5½	5½	5½
Huddersfield	10	9½	9½	9½	10	9	8½	7	7	7
Hull	10½	10	10	10	10	9½	8½	7½	7½	7½
Ipswich	8½	8½	8½	9	9	8½	7	5½	5½	5½
Lancaster	10	10	9	9	9	9	9	5½	6	6
Leamington Spa	9	9	9	8½	9	8½	8	6	6	6
Leeds	10	10	10	10	9	10	8	7½	7½	7½
Leicester	9½	9½	10	10½	9½	9½	9	7	7	7½
Lincoln	9	8½	8½	9	8	8½	8	6	5½	6
Liverpool	11	11	11	11	10½	11	9½	7	7	7
Llanelly	9½	9½	9½	8½	9	8½	8	5½	5½	5½
London	11½	11½	11½	11½	—	1s.	9	8	8	8
Loughborough	9	8½	8½	9	9	8½	7½	5½	5½	5½
Luton	9½	8½	8½	8½	9	8½	7½	5½	5½	5½
Maidstone	9	9	9	9	9	9	8	6	6	6
Manchester	10	10½	10½	11	10	10	9½	6½	6½	7½
Mansfield	8½	9	8½	8½	—	8½	8	6	6	—
Merthyr Tydfil	9½	9½	9½	9½	8½	9	8	6½	6½	6½
Middlesbrough	9	10	9½	10	10	10	8½	7	7	7½
Newcastle-on-Tyne.	10½	10½	10½	10½	10	10	9	7½	7½	7½
Newport, Mon.	9½	9½	9½	9½	8½	9½	8½	6½	6½	6½
Northampton	9	9	9	9	8½	9	8	6	6	6
Norwich	8	8½	8½	8½	8	8½	7	5½	5½	5½
Nottingham	10	10	10	10½	9½	10	9	7½	7½	8
Oldham	10½	10½	10½	10	9	10	9½	7	7	7½
Oxford	9½	9	9	9	8	9	8	7	7	7
Plymouth	9	9	9	9	9	9	7½	6	6	6
Pontypridd	9½	9	9	9½	9	9	8	6½	6½	6½
Portsmouth	9½	9½	9½	9½	—	8½	7½	7	7	7
Preston	10½	10½	10	9½	9½	10	9½	5½	6	6½
Reading	8½	9	9	9½	—	9	7½	6	6	6
Rochdale	10	10½	10	10	8½	9½	9	7	7	7½
Rochester	8	9	9	9	9	8½	7	6	6	6
Rugby	9½	9½	9½	9½	8	9½	8½	6	6	6
St. Albans	9	9	9	9-10	9	9-10	8	6½	6	6½
St. Helens	9	9½	10	9½	9½	9½	9½	6	6	6
Scarborough	8½	9	8½	8½	8	9	8	6½	6½	6½
Sheffield	10½	9½	9½	9½	9½	9½	8½	6½	6½	6½
Shrewsbury	8½	8½	8½	9½	—	8½	7	5½	5½	5½
Southampton	8½	9½	9½	8½	—	9½	8½	6½	6½	6½
Southend-on-Sea	9	9	9½	9	P'cework	9	7	6	6	6
Southport	10	10	9½	9½	9½	9½	9½	6	6½	6
South Shields	10½	10½	10½	10½	10	8½	9	7½	7½	7½
Stockport	10½	10	10	10½	9	10	8½	6	6½-7	7½
Stockton-on-Tees	9	10	9½	10	10	10	9	7	7	7½
Stoke-on-Trent	9	9½	9	9	—	8½	8½	6	6	—
Stroud	7½	7½	7½	7½	7½	7½	7	5	5	5
Sunderland	10	10½	10	10	10	9	9	6½	6½	7
Swansea	9½	9½	9½	9½	8½	9	9	6½	6½	6½
Taunton	7	7	7	7	—	6	6½	4½	4½	4½
Torquay	8	8	8	8	8	8	8	6	6	6
Wakefield	9½	9½	8½	9½	8½	9	8	7	7	7
Walsall	9½	9	9	9	8½	9	8	6½	6½	6½
Warrington	8½	9½	9½	10	8½	9½	8½	5½-6	6	6 6½
West Bromwich	10	10	9½	9½	—	9	8	7	7	7
Wigan	10	10½	9½	9½	9	9½	9½	7	7	7
Windsor	9	9	9	10	—	9	—	6	6	6
Wolverhampton	9½	9½	9½	10	8	10	8	6½	6½	6½
Worcester	8½	9	9	9	8½	9	7½	6	6	6
York	9½	9½	9	9½	9½	8½	8	6½	6½	6½

The mason's rate given is for bankers; fixers usually ½d. per hour extra.

Barron, architects, be instructed to prepare plans. The cost of the extension is estimated by the Borough Treasurer at £100,000.

Reigate.—Plans approved by R.D.C. :—Two cottages for Mr. Harry Nuttall, M.P., in Sandlands-road, Walton.

Rhosddu.—In consequence of the tenders for remodelling the Council school, etc., having largely exceeded the estimate of £3,500, the Denbighshire E.C. have instructed the County Architect to carry out the work.

Rochdale.—The B.G. have approved plans for a mortuary, and an estimate is to be prepared.

Romford.—Plans for three furnace pits and chimney shafts at the Sterling Works, Romford-road, Dagenham, for the Sterling Telephone Company, Ltd., have been approved.

Ruislip.—Plans passed by U.D.C. :—House, Frithwood-avenue, for Mr. A. Taylor, submitted by Mr. G. E. Clare; house, Eastbury-road, for and submitted by Mr. H. Neal.

Rutherglen.—The T.C. have appointed Mr. J. Gaff Gillespie, architect, Glasgow, to prepare amended plans for the reconstruction of the Town Hall, and Mr. George Sinclair, architect, Glasgow, amended plans for the erection of new buildings at the Old Manse site in Main-street.

St. Helens.—The Licensing Justices have granted Messrs. Greenhill, Whitley, & Co. permission to rebuild the "Seven Stars," Millbrook-lane, Eccleston.

Sedgefield.—Plans have been passed for three new cottages at Mainsforth for Col. Surtees.

Slough.—A plan for the extension of Messrs. Horlick & Co.'s premises in Stoke Poges-lane has been approved by the U.D.C.

Stamford.—Plans passed :—House in Prince's-road for Mr. Howes; additions to their farm premises on the Empingham-road for the Trustees of Sidney Sussex College; cowshed in Foundry-road for Mr. Broome; alterations to the Crown Hotel for Messrs. Phipps & Co.

Swanage.—Alterations to No. 1, Institute-road, for the Capital and Counties Bank.

West Ham.—The T.C. have granted a licence to Messrs. Oppenheimer & Co. to establish a gut-cleansing business at Sugar House-lane, conditional on new buildings and plant being erected and provided to the satisfaction of the Borough Engineer and Medical Officer of Health.

Yiewsley.—The U.D.C. are to consider a scheme for building fifty houses.

GENERAL BUILDING NEWS.

CATHEDRAL, GEORGETOWN, DEMERARA.

After visiting the site at Georgetown, British Guiana, Mr. Leonard Stokes, F.R.I.B.A., has prepared the plans for a cathedral in that capital. The ground being swampy, special raft foundations have had to be devised. The building has been schemed by Mr. Stokes, in conjunction with the Considère Construction Company, Ltd., Victoria-street, S.W., and most of the materials will be exported from this country.

WHITEKIRK CHURCH, RESTORATION.

At a meeting of the Presbytery of Dunbar recently plans were submitted for the restoration of Whitekirk Parish Church. Sir Robert Lorimer, the architect, explained the details of the scheme, showing that the plan aimed at restoring the building as nearly as possible to its original features. The Presbytery approved of the plans, with certain reservations regarding the provision of seating accommodation. The total sum available for the restoration scheme is £6,500, which it is expected will cover the whole cost of the work. It was intimated that the work was now in process of being carried out.

CHURCH, WEARDALE.

The consecration of a new church and churchyard for the parish of Heatherycleugh (Durham County) took place recently. The church is built at Cowshill, in the centre of this parish, and has been erected by the Ecclesiastical Commissioners to replace the old church, which, being endangered by mining operations, has been taken down. The building has accommodation for 180 worshippers, and has been erected at a cost of about £2,500. Messrs. Clark & Moscrop, of Darlington, were the architects, and Mr. James Hopper, of Wolsingham, was the contractor.

THE INSTITUTE OF MARINE ENGINEERS.

The new building for the Institute of Marine Engineers, near Tower-hill, is approaching completion. It is on an island site bounded by the Minories, Royal Mint-street, and Shorter-street. The foundation-stone was laid in October, 1913, by Sir David Burnett, Bart., then Lord Mayor of London, during the Presidency of Mr. Thomas L. Devitt. The chief entrance is at the corner of the Minories and Royal Mint-street, but there is a side entrance which communicates with the lower ground floor, which contains a large space to be divided up into letting offices. The library, secretary's room, and writing-room are on the ground floor; the lecture-room is on the first floor; a billiard-room is on the second floor, and on the third floor are housekeeper's bedrooms, sitting-room, kitchen, and bathroom. There is lavatory accommodation on every floor. Mr. Victor Wilkins, Thames-chambers, 12,

York-buildings, Adelphi, is the architect. The general contractors are Messrs. Higgs & Hill Ltd., Crown Works, South Lambeth-road, S.W., and the steel construction is by the Fawcett Construction Company, Ltd., Victoria-street, S.W. The following are the sub-contractors:—Asphalt, Messrs. Thomas Faldo & Co., Ltd., Effingham House, Arundel-street, W.C.; bricks, Messrs. Eastwood & Co., Ltd., Belvedere-road, Lambeth, S.E., and Messrs. the Fletton Crown and Crowhurst Brick Company, Ltd., Nicholas-lane, E.C.; carving and sculpture, Mr. George Alexander, Justice Studios, Chelsea; fireplaces, Messrs. George Wright, Ltd., Queen Victoria-street, E.C.; flooring, paving, etc., Messrs. Carter & Co., Ltd., Poole, and Albert-embankment; wood-block flooring, Messrs. Turpin's Parquet-Floor, Joinery, and Wood-Carving Company, Elgin-crescent, W.; staircase and outside railings, Messrs. W. T. Allen & Co., Queen Victoria-street, E.C.; pavement lights and spiral staircase, Messrs. Hayward Brothers & Eckstein, Ltd., Union-street, Borough; glass, Messrs. James Clark & Sons, Ltd., Scoresby-street, Blackfriars-road, S.E.; heating, Messrs. Wontner-Smith, Gray, & Co., Ltd., Sun-street, Finsbury, E.C.; service lift, Messrs. Aldous & Campbell, Lower Blandstreet, S.E.; electric-light fittings, Mr. Albert C. Hands, Snow-hill, E.C.; door furniture, Messrs. Yannedis & Co., Featherstone-buildings, Holborn, E.C.; patent fire-resisting glazing, Messrs. the British Luxfer Prism Syndicate, Ltd., Hill-street, E.C. The stained glass figure of James Watt was presented by a member of the Institute of Marine Engineers, Mr. John Irving, and has been adapted for its present position by the Luxfer Company. The clerk of works is Mr. G. Huntley.

BUSINESS PREMISES, GOLDEN-SQUARE, W.

The extensive premises for Messrs. Gagnière & Co., Ltd., 34-36, Golden-square, and Beak-street, W., are approaching completion. The architect is Mr. Leonard Stokes, F.R.I.B.A., Great Smith-street, Westminster. The general contractors are Messrs. Ashby & Horner, Aldgate, E.; the steelwork is by Messrs. H. Young & Co., Ltd., Nine Elms Iron Works, Vauxhall, S.W.; the electric lifts are by Messrs. Waygood & Co., Ltd., Falmouth-road, S.E.; the heating is by Messrs. Strode & Co., Osnaburgh-street, Regent's Park, N.W.; the fireplaces are by Messrs. Bratt, Colbran, & Co., Mortimer-street, W.; the granolithic work is by Messrs. Stuart's Granolithic Company, Ltd., Bedford-row, W.C.; the casements are by Messrs. R. E. Pearse & Co., Ltd., Upper Kennington-lane, S.E.; the floor and pavement lights are by Messrs. the British Luxfer Prism Syndicate, Ltd., Hill-street, Finsbury, E.C.; the wood floors are by the Acme Flooring and Paving Company, Ltd., Gainsborough-road, S.E.; the sanitary fittings are by Messrs. John Bolding & Sons, Ltd., Davies-street, W.; the wall and floor tiling is by Messrs. Martin Van Straaten & Co., Little Britain, E.C.; the fireproof roller shutters inside the building and the safes are by Messrs. Milner's Safe Company, Ltd., Finsbury-pavement, E.C.; the electric-light engineering is by Messrs. Higgins & Griffiths, Orchard-street, N.W.; the roof lights are by Messrs. W. H. Heywood & Co., Victoria-street, S.W., and the British Challenge Glazing Company, Ltd., Tooley-street, E.C.; the roof sunblinds are by Messrs. Samuel Haskins & Brothers, Ltd., Old-street, E.C.; the iron railings are by Messrs. Thomas Brawn & Co., Clement-street, Birmingham; the rain-water heads and large metal letterings across the building are by Messrs. Thomas Elsley, Ltd., Great Titchfield-street, W.; the carving is by Mr. A. Broadbent, Fulham Studios, Fulham-road, S.W.; and the pneumatic tube for samples is by Messrs. Reid Brothers, Ltd., Wharf-road, City-road, N. The door furniture, etc., is by Messrs. N. F. Ramsay, Ltd., Victoria-street, S.W.

TRADE NEWS.

Boyle's latest patent "air-pump" ventilator has been applied to the Central Council Cookery Centre, Ipswich.

The new branch for the Capital and Counties Bank, 134, Great Portland-street, is being carried out by Mr. Charles R. Price (late S. J. Scott), builder and contractor, 87, Bishopsgate, London, E.C., and also the large temporary building at King's College Hospital for the War Office.

The Children's Home, Nuneaton, is being ventilated by means of Shorland's patent exhaust roof ventilators, supplied by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

SANITARY RECORD YEAR-BOOK.

The Sanitary Publishing Company, Ltd., 55-56, Chancery-lane, W.C., have sent us a copy of the "Sanitary Record and Municipal Engineering" Year-Book and Empire Directory of Municipal Authorities and Officials for the ensuing year. It is the thirty-third issue of a useful publication, and since the book was last published considerable additions have been made to it. The Directory of Municipal Authorities and their Officials now covers practically the whole of the British Empire. The trades directories have been revised and many new features have been introduced. The price is 5s. 4d. post free.

CAPTURING ENEMY PATENTS.

THE following list of British patents, which have been granted in favour of residents of Germany, Austria, or Hungary, is furnished in view of the new Patents Acts, which empower the Board of Trade to confer upon British subjects the right to manufacture under enemy patents, and is specially compiled for the *Builder* by Mr. Lewis William Goold, chartered patent agent, 5, Corporation-street, Birmingham. It is desirable in the first instance to obtain the latest particulars upon the Patents Register. If any patent listed has been assigned to a non-enemy proprietor, the law does not apply:—

3,109 of 1912.—Draughting machines. Relates to parallel rulers of the class in which the ends of the ruler are fitted with sheaves which engage one or more wires or cords secured to the drawing-board and led to and fro across the board between the sheaves: S. Sandurskyj, Vienna.

3,207 of 1912.—Sliding doors. Hangers for sliding doors: K. Strohmann and H. A. Schindler, Germany.

3,372 of 1912.—Ladder scaffolding. Movable stands for supporting ladders used in scaffolding: A. Panzenhagen, Germany.

3,518 of 1912.—Door and like closing appliances: A. Lochert, Germany, and Florozon-Ges., Berlin.

3,736 of 1912.—Electric door-opening appliances: G. Korytowski, Berlin.

3,747 of 1912.—Scaffold brackets. Ladder or scaffold brackets suspended from the rungs or like members: Rolf & Co., Germany. Dated February 16, 1911.

3,867 of 1912.—Water-waste preventers: H. Goldau, Prussia.

4,069 of 1912.—Incandescent gas-burners: O. Lenz, Berlin. Dated April 1, 1911.

4,074 of 1912.—Ladders: H. Beier, Germany.

4,172 of 1912.—Moulding floors and ceilings: O. Arndt, Germany. Dated October 20, 1911. Addition to 6,250 of 1911.

4,183 of 1912.—Moulding walls *in situ*: A. Kleber, Prussia.

4,260 of 1912.—Reinforced concrete. Concrete beams are reinforced by means of several layers of steel wires, which are retained in place by interlaced cross-wires. The steel used has the elastic limit near the breaking-point. Concrete columns are reinforced by straight, longitudinal steel wires and transverse wires, which, on one face, are interlaced with the main wires, and on adjacent faces pass straight across either inside or outside the main wires: J. Schrioff, Germany.

4,968 of 1912.—Windows. Relates to windows having sliding sashes, which lie in the same plane when closed and which are provided with pivots at their lower ends, working in grooves in the window-frame, so that either sash may be swung down into the horizontal position: R. Biel, Germany.

NEW COMPANIES.

THE undermentioned particulars of new companies recently registered are taken from the Daily Register compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, Chancery-lane, W.C.:—

ANGLO-BELGIAN BUILDING FINANCE CORPORATION, LTD. (139,100). Registered January 23. Merchants, contractors, builders, or agents in connection with engineering, building, and constructional works of all kinds. Nominal capital, £50,000 in 3,500 "A" £10 shares, 1,000 "B" £10 shares, and 5,000 Deferred £1 shares.

HENRY SALISBURY & SON, LTD. (139,199). Registered February 2. To acquire and carry on business of builders and contractors carried on at Harpenden as Henry Salisbury & Son. Nominal capital, £5,000 in 3,000 Ordinary and 2,000 5 per cent. cumulated Preference £1 shares.

F. & H. F. HIGGS, LTD. (139,211). Registered February 3. To carry on business of builders and contractors (being the business formerly carried on by F. Higgs and F. H. Higgs at Station Works, Hinton-road, Herne-hill, and at Cobham, Surrey). Nominal capital, £35,000 in £1 shares.

J. CHESSUM & SONS, LTD. (139,217), 7A, Southplace, City of London. Registered February 3. Builders and contractors, engineers, carters, brick, tile, and terra-cotta makers, timber merchants, plumbers, gasfitters, etc. Nominal capital £50,000 in 28,250 Ordinary and 21,750 Preference £1 shares.

PATENTS.

APPLICATIONS PUBLISHED.*

472 of 1914.—John Barron: Channel bends and the like for inspection chambers.

480 of 1914.—Frank Pascall: Combined domestic fireplaces and cooking-stoves.

512 of 1914.—William Philpot Curran Bain: Wire fencing.

569 of 1914.—Arthur Hubert Phillips and Arnold Christopher George (trading as Coup, Phillips, & Co.): Opening and closing devices for fanlights, casements, and the like.

1,053 of 1914.—Frank Pascall: Auxiliary grates for domestic stoves.

1,106 of 1914.—Robert Brodie: Device for preventing downdraught in chimneys.

1,124 of 1914.—Everard Richard Calthrop and Francis Gascoigne Lynde: Construction of pipes, conduits, sewers, and the like.

1,177 of 1914.—Charles Edward Houston: Polishing devices for surfaces, such as floors, linoleums, and the like.

1,197 of 1914.—William Thomas Bown Masters: Means of tying together partition slabs or blocks.

1,217 of 1914.—Richard Ames: Manhole frames and covers therefor.

1,462 of 1914.—Bayliss, Jones, & Bayliss, Ltd., and Samuel Bayliss: Means of straining and retaining strained the wires of strained wire fencing.

1,633 of 1914.—John Shanks: Shower-bath fittings.

2,678 of 1914.—John Gardiner Starr: Ball or float valve and stop or bibb cocks for water or other liquids.

2,990 of 1914.—Harrison Brotherton: Flexible curve devices for drawing-office and other purposes.

6,139 of 1914.—Ernest Enoch Steele Jones: Cranks or supports for glazed tiles during the process of firing.

10,544 of 1914.—Charles Adolphus Wootton: Fastener for attachment to window-sashes, French windows, doors, and the like.

12,827 of 1914.—Paul Wilhelm Sieurin: Winches.

18,579 of 1914.—Frederick Turner: Domestic firegrates and the like, and fittings therefor.

19,574 of 1914.—Raymond Harry Banning: Screen attachment for window-sash.

20,745 of 1914.—George Leslie Allen: Hollow filling blocks for concrete or other floors and the like.

23,474 of 1914.—William Bowie Young: Ranges or grates.

FOREIGN AND COLONIAL.

Building Supplies, Canada.

H.M. Trade Commissioner for Canada (Mr. C. Hamilton Wickes, 3, Beaver Hall-square, Montreal) reports that he has received the following inquiries from firms in the Dominion:—A firm in Winnipeg, having a connection throughout the Provinces of Manitoba, Saskatchewan, and Alberta, wishes to secure the representation of United Kingdom manufacturers of simple forms of metal manufacturers, builders' supplies and materials, and builders' hardware. United Kingdom manufacturers and exporters of the goods mentioned may obtain the names and addresses of the respective inquirers on application to the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, London, E.C. Further communications regarding the inquiries should be addressed direct to the inquirers.

Building Material, Netherlands.

The *Nieuwe Rotterdamsche Courant* of February 4 notifies that a proposal has been submitted to the Commercial Council of The Hague, whereby the city should advance a sum of 340,000 gulden (about £28,300) for the construction of 144 workmen's dwellings.

Brick Presses and Artificial Building Stone, Paris.

Inquiry is made for the names of United Kingdom manufacturers of brick presses and artificial building stone. (Reference No. G.W. 1,134.) Communications relating to this inquiry, quoting the reference number, should be addressed to the Secretary, British Chamber of Commerce, 9, Rue des Pyramides, Paris.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

List of Competitions, Contracts, etc.

For some contracts still open, but not included in this List, see previous issues. **Those with an asterisk (*) are advertised in this number:** Competitions, iv.; Contracts, iv., vi., viii., x.; Public Appointments, xviii.; Auction Sales, xx. Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to assure accuracy, we cannot be responsible for errors that *may* occur.

Competitions.

FEBRUARY 27.—**Spalding.**—CHILDREN'S HOME.—The Guardians of the Spalding Union invite designs, with estimate of cost, for a children's home. Mr. H. Stanley Maple, Clerk, Spalding.

* MARCH 31.—**Bradford.**—STREET PLANNING.—The Bradford Corporation invite designs for replanning of streets.

Contracts.

BUILDING AND PAINTING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

FEBRUARY 20. — **Charing.** — ALTERATIONS. — Adapting Roughton House, Charing, for a Children's Home for the West Ashford Union. Names of those desiring to tender to the architect, Mr. A. E. Lacey, Ashford.

FEBRUARY 20. — **Ridsdale.** — ALTERATIONS.—General alterations to an existing cottage at Ridsdale in order to adapt the premises for use as a public elementary school for the Northumberland E.C. Names to Mr. C. Williams, Secretary to the E.C., the Moothall, Newcastle-on-Tyne. Deposit, £1 1s.

FEBRUARY 22. — **Atherstone.**—CONVENIENCE.—Erection of a public convenience in Station-street for the Atherstone R.D.C. Specification of Mr. H. J. Coleby, Surveyor, 102, Long-street, Atherstone.

FEBRUARY 22.—**Buckland Newton.**—COTTAGES, ETC.—Erection of two new cottages, alterations, additions, and repairs to farm buildings at Brockhampton Green, Buckland Newton. Specifications of Mr. T. B. Jeffs, County Land Agent, Small Holdings Department, County Offices, Dorchester. Deposit, £1 note.

FEBRUARY 22.—**Glasgow.**—LAVATORIES.—Erection of two lavatories and the alterations on four existing lavatories at Bellahouston Park and Queen's Park. Specifications at the Office of Public Works, 64, Cochrane-street.

* FEBRUARY 23.—**Bristol.**—TOWER AND NEW BUILDINGS.—Those wishing to tender for the erection of the above buildings are invited to submit their names.

FEBRUARY 23. — **Shrewsbury.** — PAINTING. — Painting and decorating (1) interior of the Librarian's House, Free Library; (2) exterior of waterworks, cottages, and warehouses, Butcher-row. Specification of Mr. A. W. Ward, Borough Surveyor, The Square, Shrewsbury.

FEBRUARY 24. — **Balrothery.**—HOUSES.—Erection of 113 labourers' cottages for the Balrothery R.D.C. Specifications from the architect, Mr. A. Scott, C.E., 49, Upper O'Connell-street, Dublin. Charge 5s.

FEBRUARY 24. — **Dublin.**—COTTAGES.—Erection of 183 labourers' cottages for the South Dublin R.D.C. in twenty-one contracts, and for road-making, etc. Specifications of Mr. T. J. Byrne, Clerk, 1, James-street, Dublin.

FEBRUARY 24. — **Hull.** — CONVENIENCE. — For builders' work in the construction of a urinal in Division-road. Particulars of Mr. F. W. Bricknell, Acting City Engineer, Guildhall.

FEBRUARY 24. — **Manchester.** — HOSPITAL.—Erection of children's hospital for the South Manchester B.G. Quantities of Mr. F. H. Overmann, 49, King-street, Manchester. Deposit, £1 1s.

FEBRUARY 24.—**Oldham.**—STORES.—Erection of an accumulator stores in Churchill-street East. Quantities at the Borough Surveyor's Office.

FEBRUARY 25. — **Cardiff.** — ALTERATIONS.—For alterations and remodelling a building on the site of the Greek Church at Cardiff into an Archimandrite's residence, etc. Quantities from Mr. Cholton James, architect, Charles-street-chambers, Cardiff. Deposit, £1 1s.

FEBRUARY 25. — **Huddersfield.** — PAVILION.—Erection of children's pavilion at Bredley Gate for the executors of the late Mr. J. Sykes. Quantities of Mr. W. Cooper, architect, 4, Kirkgate-buildings, Huddersfield.

FEBRUARY 25. — **Sheffield.** — EXTENSION.—For building extension of engine-room, boiler-house new switch rooms, and stores at the Neepsend Electric Power Station, Sheffield, for the Corporation. Quantities of Mr. S. E. Fedden, General Manager, Commercial-street, Sheffield. Deposit, £5 5s.

FEBRUARY 26. — **Coalville.**—SHOPS, ETC.—Erection of business premises, comprising three shops, with showrooms and workshops over, in Belvoir-road, Coalville, for the Coalville Working Men's Co-operative Society, Ltd. Quantities of Mr. Thomas I. McCarthy, architect, Central-chambers, Coalville, near Leicester. Deposit, £3 3s.

FEBRUARY 27. — **Christchurch.** — MORTUARY.—Erection of mortuary for the B.G. Quantities of Mr. A. Druitt, Clerk, Christchurch. Deposit, £5.

FEBRUARY 27. — **Cleckheaton.** — RESERVOIR.—Construction of a reservoir at the Electricity Works of the U.D.C. Quantities at the Town Hall, Cleckheaton Deposit, £2 2s.

FEBRUARY 27. — **Woodston.** — FENCING.—Erection of fencing at cemetery for the Woodston Joint Burial Committee, comprising iron fencing on wall foundation, creosote wood fencing, etc Specifications of Mr. H. W. Hawkins, Surveyor, Old Fletton.

MARCH 1.—**Banwell.**—SCHOOL.—Erection of a new Council school at Banwell, etc. Specification of the architects, Messrs. Jane & Fry, Waterloo-street, Weston-super-Mare.

MARCH 1. — **Chester.**—REPAIRS, ETC.—War Department contracts for repairs and materials for the unexpired portion of the triennial contracts, viz., from April 1, 1915, to March 31, 1917, at the Shrewsbury Barracks, etc., and Wrexham Barracks, etc. Particulars of the Divisional Officer, Royal Engineer Office, 9, Stanley-place, Chester.

MARCH 1. — **Dundee.** — FOUNDATIONS.—Manufacture and driving of about 700 reinforced-concrete piles, together with other contingent works, comprising the foundations of the new City Hall, Dundee. Quantities of Mr. Jas. Thomson, City Architect, Municipal Offices, 91, Commercial-street, Dundee. Deposit, £1 1s.

* MARCH 1. — **Hornsey.** — RIFLE RANGE.—The Hornsey T.C. invite tenders for erection of a rifle range.

MARCH 1.—**Rothwell.**—ADDITIONS.—Additions to the Council Offices, Rothwell. Specifications of Mr. J. Southwart, Surveyor, Rothwell, near Leeds. Deposit, £1 1s. (postal order).

* MARCH 2.—**Barnet.**—THIRTY-TWO COTTAGES.—The Barnet U.D.C. invite tenders for erection of thirty-two cottages.

MARCH 2. — **Huddersfield.** — HOSPITAL. — Various trades required in the erection of a tuberculosis hospital at Bradley Gate, Huddersfield, for the Corporation. Quantities of the Borough Engineer, Mr. K. F. Campbell. Deposit, £1 1s.

* MARCH 3. — **Barnet.**—EXTENSION OF NURSES' HOME.—The Barnet Guardians invite tenders for extension of the nurses' home.

MARCH 4.—**Barnsley.**—TOWN HALL.—Erection of Town Hall. Specifications of the Town Clerk, Barnsley. Deposit, £2 2s.

MARCH 4. — **Huddersfield.** — FILTER-HOUSE.—Construction of a filter-house and other works on the south side of Blackmoorfoot Reservoir, Meltham, near Huddersfield, for the Corporation. Quantities of the Waterworks Engineer, Town Hall, Huddersfield.

* MARCH 5. — **Various Towns.** — WORKS AND REPAIRS.—The Commissioners of H.M. Works, etc., invite tenders for execution of ordinary works and repairs to buildings for a period of one year.

MARCH 15. — **Northampton.** — COTTAGES.—Building of twenty cottages at Hollowell for the Northampton Corporation Waterworks Committee. Quantities at the Waterworks Office, Fish-street, Northampton. Deposit, £2.

NO DATE. — **Craghead.**—HOUSES.—Erection of seventy houses at Craghead for Messrs. Thos. Hedley & Bros. Names to Mr. J. Wm. Rounthwaite, A.R.I.B.A., 13, Mosley-street, Newcastle-on-Tyne.

NO DATE. — **Rhondda.**—HOUSES.—Erection of sixty semi-detached houses, together with new street, drains, etc., at Duffryn Rhondda, for the Imperial Cottage Society, Ltd. Specifications of Messrs. Johnson & Richards, architects, Merthyr.

NO DATE. — **Rochdale.**—ALTERATIONS.—Alterations to the Lark Inn, Durham-street, and Chapeu House Inn, Halifax-road, Rochdale. Names to Messrs. Hitchon & Pickup, architects, 46, Manchester-road, Burnley.

NO DATE. — **South Moor.**—HOUSES.—Erection of sixty-eight houses at South Moor for the South Moor Colliery Company, Ltd. Names to Mr. J. Wm. Rounthwaite, A.R.I.B.A., 13, Mosley-street, Newcastle-on-Tyne.

NO DATE. — **Wigan.**—PAINTING.—For painting three cottages in Glebe End-street. Particulars of Mr. W. Major, 34, Pagefield-street, Wigan.

NO DATE. — **Wrexham.** — SUNDAY-SCHOOL.—Erection of a Primitive Methodist Sunday-school at Wrexham. Particulars of Mr. Hy. Harper, architect, 54, Long-row, Nottingham.

FURNITURE, MATERIALS, etc.

FEBRUARY 22.—**Epsom.**—MATERIALS.—Supply to the Epsom R.D.C. of road materials, cement, stoneware pipes, bricks, and granite kerbing, etc. Forms of tender of Mr. T. E. Ware, Surveyor, Waterloo-road, Epsom.

FEBRUARY 22.—**Hemel Hempstead.**—Supply of road materials, cement, tools, castings, etc., to the Hemel Hempstead Corporation. Forms of tender of Mr. Alfred E. Usher, Town Clerk, Town Hall, Hemel Hempstead.

FEBRUARY 22.—**Leeds.**—MATERIALS.—Supply to the Tramways and Highways Department of flags, kerbs, pavers, and setts, whinstone macadam, refined tar, cast-iron street name plates. Forms of tender at the Highways and Permanent Way Department, 155, Kirkstall-road, Leeds.

FEBRUARY 22. — **Penarth.**—ROAD MATERIAL.—Supply to the Penarth U.D.C. of mountain limestone road metalling and gravel and basalt or granite gravel. Forms of tender of Mr. Edgar I. Evans, Surveyor, D.C. Offices.

FEBRUARY 22. — **Yeovil.** — STORES.—Supply of stores to the Corporation. Schedules of the Borough Surveyor, Municipal Offices, Yeovil.

FEBRUARY 23.—**Barking.**—MATERIALS.—Supply to the Barking Town U.D.C. of tools, implements, and general ironmongery; glazed stoneware goods; Portland cement, bricks, road material, etc. Forms of tender at the Surveyor's Office, Public Offices, Barking.

FEBRUARY 23. — **Cardiff.** — MATERIALS.—Supply to Corporation Waterworks of stores, street surface covers, etc. Forms of tender of Mr. C. H. Priestley, Waterworks Engineer, City Hall, Cardiff.

FEBRUARY 23. — **London.** — GRANITE SETTS.—Supply to the L.C.C. of granite setts for use in the Tramways Department for twelve months. Form of tender, etc., from the Chief Officer, L.C.C. Tramways, 62, Finsbury-pavement, E.C.

FEBRUARY 23.—**London.**—WOOD-PAVING BLOCKS.—Supply to the L.C.C. of wood-paving blocks for use in the Tramways Department for twelve months. Form of tender, etc., from the Chief Officer, L.C.C. Tramways, 62, Finsbury-pavement, E.C.

FEBRUARY 23. — **Southall - Norwood.** — MATERIALS.—Supply to the U.D.C. of granite, lime, cement, oil, tools, etc. Forms of tender of Mr. Reginald Brown, Surveyor to the Council, Town Hall, Southall.

FEBRUARY 23. — **Southgate.** — MATERIALS.—Supply to the Southgate U.D.C. of road, paving, and sewer materials; cement; cast and wrought iron goods, etc. Forms of tender of Mr. C. G. Lawson, Surveyor, Council Offices, Palmer's Green, N.

FEBRUARY 24. — **Battersea.** — MATERIALS.—Supply to the B.C. of special paints, enamels, etc.; tools, road materials, paving materials; timber; bricks, cement, lime, etc. Forms of tender at the Town Hall, Battersea.

FEBRUARY 24. — **Fulham.**—MATERIALS.—Supply of road material, bricks, electrical stores, drain pipes, etc., for the Fulham B.C. Forms of tender of Mr. J. Percy Shuter, Town Clerk, Town Hall, Fulham, S.W.

FEBRUARY 24. — **Hammersmith.**—MATERIALS.—Supply to the B.C of stores and materials for the year ending March 31. Forms of tender of the Borough Surveyor, Town Hall, Hammersmith.

FEBRUARY 24. — **Herne Bay.** — MATERIALS.—Supply of road materials, timber, cement, tools, etc., to the Herne Bay U.D.C Forms of tender of Mr. F. W. J. Palmer, Surveyor, Town Hall, Herne Bay.

FEBRUARY 24.—**Rushden.**—ROAD MATERIALS.—Supply of granite and slag to the Rushden U.D.C. Forms of tender of Mr. W. B. Madin, Surveyor, Council-buildings, Rushden.

FEBRUARY 24.—**Southend-on-Sea.**—MATERIALS.—Supply to the Corporation of stoneware pipes, bends, etc.; flints, bricks, gravel, sand, etc.; timber; paints, oils, and colours; cement, lime, and chalk; granite kerb and channel, road materials, etc. Forms of tender of Mr. Ernest J. Elford, Borough Engineer, Southend-on-Sea.

FEBRUARY 24. — **Southwark.** — MATERIALS.—Supply to the Borough of Southwark of asphalt, bitumen, pitch, road materials, timber, paving material, etc. Specifications at the Town Hall, Walworth-road, S.E.

FEBRUARY 24. — **Sunderland.** — MATERIALS.—Supply to the Corporation of various materials required in the different services. Forms of tender of the Borough Engineer, Town Hall, Fawcett-street, Sunderland.

FEBRUARY 25. — **Dorchester.** — MATERIALS.—Supply of road materials, ironmongery, tools, etc., to the Corporation. Form of tender from the Borough Engineer, 21, North-square.

FEBRUARY 25. — **Droylsden.** — MATERIALS.—Supply to the U.D.C. of granite, earthenware pipes, cement, castings for gullies, etc., lime, etc. Forms of tender at the Council Offices, Droylsden.

FEBRUARY 25.—**Egypt.**—MATERIALS.—Supply to the Khedivial School of Arts and Crafts of wood, iron, steel, copper, and brass pipes, painters' and building materials, etc., for the Egyptian Ministry of Public Instruction. List of articles required at Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, E.C.

[Those with an asterisk (*) are advertised in this issue.]

FURNITURE, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

FEBRUARY 25. — **Hampton.** — MATERIALS. — Supply of road materials and brooms to the Hampton U.D.C. Forms of tender of Mr. Sidney H. Chambers, Surveyor, Public Offices, Hampton, Middlesex.

FEBRUARY 25. — **Islington.** — MATERIALS. — Supply to B.C. of road material; timber, etc.; manhole and other covers, gully grates, guard posts, castings, etc.; iron, steel, and tools; Portland cement and lime; stoneware pipes, bends, etc. Forms of tender at the Town Hall, Upper-street, N.

FEBRUARY 25. — **Shepton Mallet.** — ROAD MATERIAL.—Supply to the Shepton Mallet R.D.C. of road material, etc. Specification from Mr. James Neish, Surveyor, Charlton, Shepton Mallet.

FEBRUARY 27. — **Bury.**—MATERIALS.—Supply to the Corporation of earthenware pipes; Portland cement (English); setts, curbs; limestone chippings (grey); seconds plastic engineering bricks. The Town Clerk, Bury.

FEBRUARY 27.—**Dartford.**—MATERIALS.—Supply of road materials to the R.D.C. Forms of tender of Mr. J. Hookins, Surveyor, "Gartley," Dartford.

FEBRUARY 27. — **Denbighshire.**—MATERIALS.—Supply to the Denbighshire C.C. (Eastern Division) of roadstone and tar-macadam, Portland cement, hydraulic lime, setts, and drain pipes. Forms of tender of Mr. Ellis W. Jones, Aelybryn, Wrexham.

FEBRUARY 27.—**Earby.**—MATERIALS.—Supply to the Earby U.D.C. of road materials, iron castings, earthenware goods, etc. Forms of tender of Mr. Jas. E. Aldersley, Surveyor, Council Offices, Earby.

FEBRUARY 27. — **Preston.**—ROAD MATERIALS.—Supply of road materials to the Lancashire C.C. Forms of tender of Mr. W. H. Schofield, County Surveyor, County Offices, Preston.

FEBRUARY 27. — **South Shields.**—MATERIALS.—Supply to the Corporation of road, paving, and sewer materials, cast-iron work, shovels, scavenger brooms and machine brooms, coal, coke, paints, glass timber, etc. Forms of tender of Mr. Leslie Roseveare, Borough Engineer, Municipal Buildings, South Shields.

FEBRUARY 28. — **Middleton.** — MATERIALS. — Supply to the Corporation of macadam, setts, curbs, flags, cement, pipes, pitch and oil, and castings. Mr. F. Entwistle, Town Clerk, Town Hall, Middleton.

MARCH 1. — **Ealing.** — MATERIALS.—Supply to the T.C. of limes, pipes, etc.; cement; ironmongery; iron castings; paints, oils, etc.; granite; refined tar; tarred macadam, etc. Forms of tender of the Borough Surveyor, Mr. W. R. Hicks, Town Hall, Ealing, W.

MARCH 1. — **Maesteg.**—MATERIALS.—Supply of road, paving, sewer, and other materials to the Maesteg U.D.C. Forms of tender of Mr. Samuel J. Harpur, Surveyor, 32, Commercial-street, Maesteg.

MARCH 1. — **Margate.**—MATERIALS.—Supply to the Corporation of (*a*) road materials, pipes, timber, and other materials; and (*b*) materials and fittings for the Waterworks Department. Forms of tender of Mr. E. A. Borg, Borough Engineer, for section (*a*), and Mr. F. Stanley, Waterworks Manager, for section (*b*), at 13, Grosvenor-place, Margate.

MARCH 1.—**Marylebone.**—MATERIALS.—Supply to the B.C. of road materials, paving materials, Portland cement, lime and bricks, wood blocks, ironwork for sewers and iron castings, timber, plumbers' materials, etc. Particulars of Mr. J. Paget Waddington, Borough Surveyor, Town Hall, Marylebone-lane, Oxford-street, W.

MARCH 1.—**Sleaford.**—GRANITE.—Supply to the Sleaford U.D.C. of 1,000 tons of granite. Forms of tender of Mr. J. W. Bell, Clerk, 27, Carre-street, Sleaford.

NO DATE.—**Stockport.**—FURNITURE.—Supply to the Stepping Hill Hospital of furniture, etc., for the Stockport B.G. Forms of tender of Mr. Charles F. Johnson, Clerk, Union Offices, Shaw Heath, Stockport.

ENGINEERING, IRON, AND STEEL.

FEBRUARY 22.—**Aberdeen.**—HEATING, ETC.—For heating and painter works at Corporation's new car-shed. Quantities of Mr. W. Dyack, Borough Surveyor, Aberdeen.

FEBRUARY 22. — **Dunoon.**—SEA-WALLS, ETC.—(1) Repairing of sea-walls and causeway at the following places, viz.:—(*a*) Tighnabruaich; (*b*) between Blairmore and Ardentinny; (2) for raising of roadway on Lochlongside between Ardgartan and Head of Loch Long for a length of 150 yds., for the Cowal District Committee of the C.C. of Argyll. Specifications of Messrs. W. & W. Dissellduff, Joint District Clerks, 160, Argyll-street, Dunoon.

FEBRUARY 22. — **Hindley.** — GAS STORES. — Supply to the Hindley U.D.C. of wrought-iron tubes and fittings, gas meters, gas fittings, water fittings; lead, gas and water pipe; gas main cocks. Forms of tender of the Gas Engineer, Hindley.

FEBRUARY 22. — **Wombwell.** — CARBONISING PLANT. — Erection of carbonising plant at the U.D.C.'s Gasworks, with a capacity of 650,000 cubic ft. per diem. Specifications of Mr. P. D. Walmsley, Engineer, Gasworks, Wombwell, Yorks.

FEBRUARY 23.—**Manchester.**—PUMPS.—Supply at the Stuart-street Generating Station of two low-pressure circulating water-pumps. Specifications of Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester.

FEBRUARY 23. — **Manchester.**—PIPES.—Supply of galvanised steam pipes, etc., for the Markets Committee. Specification of the Superintendent, Markets Department, Town Hall, Manchester.

FEBRUARY 23.—**Rhyl.**—PIPES.—Supply of 1,100 6-in. socket and spigot cast-iron pipes to the U.D.C. Specifications of Mr. L. G. Hall, Water Engineer, Paradise-street, Rhyl. Deposit, £1 1s.

FEBRUARY 23.—**Southwark.**—BOILER.—Supplying and fixing a new boiler at the Newington Institution, Westmoreland-road, Walworth, S.E., for the Southwark Guardians. Specification of Mr. Sydney Wood, Clerk, Union Offices, Ufford-street, Blackfriars, S.E.

FEBRUARY 24. — **Goole.** — HOOD.—Supply of a wrought-iron hood for hydraulic fourway centre valve at the Gasworks of the Goole U.D.C. Specification of Mr. J. Fazakerley, Gasworks, Goole.

FEBRUARY 24. — **Hammersmith.**—ELECTRICITY STORES.—Supply to the Hammersmith B.C. of general electricity stores. Forms of tender of Mr. G. G. Bell, Borough Electrical Engineer, 85, Fulham Palace-road, W.

FEBRUARY 25.—**Wallasey.**—CRANES.—Supply of two overhead travelling cranes (10 tons and 5 tons) and one overhead hand crane (1 ton). Particulars of the Borough Engineer, 18, Falkland-road, Wallasey.

FEBRUARY 27. — **Castlerea.** — RAM-PUMPS.—Supply and erection at Castlerea of two sets (duplicates) of vertical three-throw ram-pumps, each direct-driven by oil engine, for the Castlerea R.D.C. Particulars of Mr. C. Mulvany, M.Inst.C.E., Roscommon.

MARCH 2. — **Sheffield.**—GIRDERS, ETC.—Supply of about 140 tons of cast-iron girders and columns, etc., for the Directors of the Sheffield United Gas Light Company. Quantities of the Engineer, Mr. J. W. Morrison, Commercial-street, Sheffield.

MARCH 2. — **Sheffield.**—TANK.—Excavation and construction of a concrete tar and liquor tank, 141 ft. 6 in. long by 58 ft. 6 in. wide by 24 ft. deep, at the Grimesthorpe Station of the Sheffield United Gas Light Company. Quantities of the Engineer, Mr. J. W. Morrison, Commercial-street, Sheffield.

MARCH 4.—**Salford.**—GASHOLDER.—Repairs to a four-lift gasholder, 150 ft. diameter, for the Corporation. Specification of Mr. William W. Woodward, Engineer, Gas Offices, Bloom-street, Salford.

MARCH 10. — **Manchester.**—DOCK.—Construction of dry dock No. 3, and auxiliary works thereto, on the westerly side of the Manchester Ship Canal Docks, at Mode Wheel, Stretford, for the Manchester Dry Docks Company, Ltd., Manchester. Quantities at the offices of the Company, Mode Wheel, Manchester Docks. Deposit, £3 3s.

NO DATE.—**Blackburn.**—MATERIALS.—Supply to the Tramways Department of iron, steel, bolts, screws, etc. List of Mr. J. H. Cowell, General Manager, Tramway Office, Blackburn.

NO DATE. — **Short Heath.** — BRIDGE.—Reconstruction and widening of Lane Head Bridge for the Short Heath U.D.C. Quantities from Messrs. Dodd & Dodd, County-chambers, Corporation-street, Birmingham. Deposit, £2.

NO DATE.—**Shrewsbury.**—BOILER.—Supplying and fixing sectional boiler at Besford House, Shrewsbury. Forms of tender from Mr. E. P. Everest, Clerk to the Guardians, St. John's-hill, Shrewsbury.

ROAD, SANITARY, AND WATER WORKS.

FEBRUARY 22. — **Conisborough.** — ROADS.—Improvement of corner of Low-road, etc., for the Doncaster R.D.C. Quantities of Mr. W. R. Crabtree, Surveyor, Union Offices, High-street, Doncaster.

FEBRUARY 22. — **Evesham.** — WATER SUPPLY.—Provision and laying of about 3 miles of 4-in. and 3-in. cast-iron water-mains, etc., for the Evesham R.D.C. Quantities of the engineers, Messrs. Willcox & Raikes, Union-chambers, 63, Temple-row, Birmingham. Deposit, £3 3s.

FEBRUARY 22. — **Wakefield.** — CULVERT.—Construction of brick and concrete culvert at Belle Isle, Barnsley-road, for the Corporation. Quantities of Mr. J. P. Wakeford, City Surveyor, Town Hall.

FEBRUARY 23. — **Cardiff.**—STREET WORKS.—For jobbing masons' work for the Corporation Water Committee for twelve months. Specifications of Mr. C. H. Priestley, Waterworks Engineer, City Hall, Cardiff.

FEBRUARY 23.—**Hemsworth.**—ROADS.—Making up Back Queen-street, Grimethorpe, for the Hemsworth R.D.C. Specifications of Mr. J. H. Richardson, Hemsworth.

FEBRUARY 23.—**Southampton.**—STREET WORKS.—Executing private street works in Empress-road. Quantities at the Borough Engineer's Office, Municipal Offices, Southampton. Deposit, £1 1s.

FEBRUARY 24. — **Rochdale.** — STREET WORKS.—Making up Burnaby-street. Quantities at the Borough Surveyor's Office.

FEBRUARY 24.—**St. Albans.**—SEWERS.—Providing and laying sewers in St. Michael and Abbots Langley for the St. Albans R.D.C. Quantities of Mr. H. F. Mence, 11, St. Peter's-street, St. Albans. Deposit, £1 1s.

FEBRUARY 25. — **Islington.** — SEWER WORK.—Work in connection with construction and repairs to sewers for the B.C. for one, two, or three years. Average for last three years £3,350 per annum. Schedule at the Town Hall, Upper-street, Islington, N. Deposit, £5.

FEBRUARY 26. — **Conisbrough.** — SEWAGE DISPOSAL.—Additions and extensions to the Sewage Disposal Works at Conisbrough, for the Doncaster R.D.C. Names to Messrs. D. Balfour & Son, Civil Engineers, 3, St. Nicholas-buildings, Newcastle-on-Tyne. Deposit, £5.

FEBRUARY 26.—**London.**—SANITARY.—The Commissioners of His Majesty's Works, etc.; invite tenders for (1) watering the roads, etc.; (2) carting away slop, etc., during a period of three years, in Regent's Park. Forms of tender of Mr. W. D. Webster, Superintendent's Lodge, Regent's Park, London, N.W.

FEBRUARY 26. — **Merton.** — STREET WORKS. — Making up Cavendish-avenue (for a length of about 135 yds.) for the Merton and Morden U.D.C. Specification of Mr. G. Jerram, Surveyor, Council Offices, Merton. Deposit, £2.

FEBRUARY 26.—**Merton.**—TAR-PAVING.—For tar-paving the footpaths in a portion of Cavendish-avenue for the Merton and Morden U.D.C. Specification of Mr. G. Jerram, Surveyor, Council Offices, Merton.

FEBRUARY 27.—**Preston.**—STEAM-ROLLERS.—The Lancashire C.C. invite tenders for the hire of steam-rollers during the year ending March 31, 1916, or for a period of three years. Particulars of the County Surveyor, Mr. W. H. Schofield, County Offices, Preston.

FEBRUARY 27. — **South Shields.** — STREET WORKS.—Providing and laying *in situ* concrete for footways and back streets in the Borough for twelve months. Specification of Mr. Leslie Roseveare, Borough Surveyor, Municipal Buildings, South Shields.

FEBRUARY 27. — **Stretford.** — STREET WORKS.—Making up Darley-street (extension), Hornby-road, and Melton-street (extension) for the Stretford U.D.C. Quantities of Mr. E. Worrell, Surveyor, Council Offices, Old Trafford. Deposit, £2 2s.

MARCH 1. — **Batley.**—STREET WORKS.—Making up Primrose-hill, Ealand-road, Amber-street, and Pearl-street. Specifications of the Borough Engineer, Mr. O. J. Kirby, Town Hall, Batley.

MARCH 1. — **Ealing.**—SLAB-MAKING.—For slab-making, etc., for twelve months for the Corporation. Particulars of Mr. W. R. Hicks, Borough Surveyor, Town Hall, Ealing.

MARCH 1.—**Whitehaven.**—SEWERAGE WORKS.—Construction of about 2,700 lin. yds. of 6-in., 9-in., and 12-in. sewers, etc., at Beckermet for the Whitehaven R.D.C. Quantities of Mr. G. Boyd, 35, Queen-street, Whitehaven. Deposit, £1 1s.

MARCH 3. — **Elland.**—STREET WORKS.—Making of Church-lane, Lower Edge, Elland, for the U.D.C. of Elland. Quantities from the Surveyor, Mr. P. H. Whitwam, Council Offices, Elland.

MARCH 3.—**Lichfield.**—SEWERAGE WORKS.—For sewage scheme at Watling-street, Brownhills, for the Lichfield R.D.C. Quantities of Mr. C. C. Rawstron, Surveyor, Lichfield. Deposit, £2 2s.

* MARCH 15. — **Eynsford, Kent.**—ALTERATIONS TO SANITARY ARRANGEMENTS.—The Kent E.C. invite tenders for alterations and improvements to the sanitary arrangements at Eynsford School.

NO DATE.—**Ashington.**—DRAINS.—Reconstruction of drains, etc., and out-house alterations at the Excelsior Social Club, 136, Middle Market, Ashington. Particulars of Mr. Thos. Floyd, Secretary.

Public Appointments.

* FEBRUARY 26.—DRAUGHTSMAN.—The Gravesend B.C. invite applications for the above post. Salary, £2 2s. per week.

* NO DATE.—DRAUGHTSMEN.—The Public Works Department, Sierra Leone Government, invite applications for above positions. £300 per annum and free quarters.

Auction Sales.

* FEBRUARY 24.—Messrs. Churchill & Sim will sell by auction, at the Great Hall, Winchester House, Old Broad-street, E.C., an assortment of deals, battens, boards, timbers, etc.

* FEBRUARY 24.—**Pimlico.**—Mr. H. Butcher will sell by auction, on the premises, the stock of builders' and furnishing ironmongery.

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to THE BUILDER LTD., and *not* to the Editor.

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All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

[Those with an asterisk (*) are advertised in this issue.]

THE SOCIETY OF ARCHITECTS.

AT a meeting of the Society of Architects, held on the 11th inst., Mr. A. Alban H. Scott, Vice-President, read a paper on "The Construction and Protection of Buildings in Relation to Fire," in the course of which he said :—

"With all the means at our disposal to-day for preventing and fighting fires, we still have appalling loss of life and damage to property through fire. Every year improvements are made in all branches to prevent such loss, and again every year seems to bring forward also more hazardous trades, more concentration and other causes of large loss. The development of the uses of celluloid and other inflammable substances has alone increased many risks. Again, do not all the precautions taken add somewhat to people's carelessness or apathy, perhaps through a feeling of over-security? If only carefulness increased as the cube of the precautions, we should, indeed, see a great reduction of outbreaks of fire.

In giving a paper of this description, it would be impossible to do so without referring to that excellent institution, the British Fire Prevention Committee, with which two of our members—namely, Mr. Edwin O. Sachs and Mr. Ellis Marsland—have been so long associated, and have taken such an infinite amount of care and devoted so much time to its work. Although I have been a member of the British Fire Prevention Committee for some period and duly receive from time to time their valuable publications, it is only when one commences to study them in detail that one fully realises the enormous ground such a Committee cover; from the testing of flannelette up to the testing of heavy reinforced concrete floors, and special commissions and reports on what our friends in France and Russia have done in fire precautions.

There is one case I would particularly like to call your attention to which is most instructive and interesting, and that is, the testing to ascertain the relative fire resistance on ten different wooden doors. This is a very practical test, inasmuch as the designs of doors chosen are those practically in everyday use, dealing with the ordinary ledged doors up to the 2-in. framed hard wood door.

In speaking of wood doors it should always be remembered that every piece of wood and other combustible material used for the construction or in the fitting up of a building furnishes fuel for the fire.

In reading through the London Building Acts with fire precautions specially in mind, it is pleasing to note what great care has been taken generally regarding the construction of buildings from the fire point of view. In spite of all these precautions, I think additional provision for escape of occupants in case of fire should be provided and the powers given to the Council still further increased in this respect.

It would be advisable for the London Building Acts, and in fact all our by-laws throughout the country, to make it compulsory that all external walls and internal partitions and floors are constructed of fire-resisting material. This sounds perhaps rather a startling proposition, but if we just consider for a moment the following figures it does not perhaps mean quite such a drastic expense as one would think from an outline statement.

The whole of the following costs have been based on the current cost of materials :—

Floors.	Per ft. sup. Pence.
Wooden floors suitable for domestic buildings taken in spans of 12 ft.	11·3
Fire-resisting floor, ditto	17·3
Wooden floors for workshop at 200 lbs. super load per square foot. Spans 10 ft.	28·9
Ditto. Fire-resisting floors.	34·4

Basis of last two items taken for floor 30 ft. by 100 ft.

	Per yard sup. Pence.
Cost of wood framed partition, plastered on both sides, per yard super	72·8
Cost of fire-resisting partition, plastered on both sides	72·0

Although there has been, through various causes, such a levelling-up of prices and gradual reduction in the difference of cost between fire-resisting and combustible materials, there is one point in the construction of work where this has not occurred quite so rapidly as one would perhaps desire, namely, in the construction of windows.

Wooden windows have always been very much cheaper than steel windows, and, unfortunately, there is still a big difference. (This does not refer to steel sashes suitable for factories and workshops; these are cheaper than wood.)

I would suggest that some special endeavour should be made to bring the cost of steel windows more to the level of wooden windows.

The London Building Acts should perhaps be considered one of the wonders of the world, but I think that there is no Act in Great Britain more courteously, fairly, and sensibly interpreted and administered.

It would, I think, be a great mercy to the building owner, the community generally, and to architects if the London Building Acts were in force through the country (with certain modifications), and administered by district surveyors of the same standard and training as in London.

I do not propose to touch upon all the points in these Acts which relate directly or indirectly to fire prevention in its various aspects. The widths of streets and frontage lines indirectly bear upon the point as well as courts within a building and space at rear of domestic buildings. As to the courts, I would like to see introduced that where the opposite walls of courts are less than a certain distance apart all openings in the walls should be protected by fire-resisting wired glass and hard metal frames and sashes."

The author then went through the various clauses of Acts bearing on the subject, making comments and suggestions, and also discussed the Insurance Companies' requirements, subsequently dealing with the various methods for extinguishing fires.

LAW REPORTS.

OFFICIAL REFEREE'S COURT.
(Before Mr. MUIR MACKENZIE.)

Leaver *v.* Girls' Public Day Schools Trust.

THIS was an action in which the plaintiff, the owner of a house, No. 8, Norfolk-terrace, Brighton, claimed from the Girls' Public Day Schools Trust the sum of £159 for repairs and £25 for loss of rent during the period occupied in putting the premises in repair.

Mr. Tebbs was counsel for the plaintiff, and Mr. Foá appeared for the defendants.

The hearing occupied several days, and many witnesses were called on both sides.

The Official Referee, in giving judgment, said that the action was brought by the assignee of a reversion upon the determination of a tenancy agreement for damages by reason of a breach by the tenant of repairing obligations contained in the agreement—in particular the obligation to leave the premises in repair as required by the covenant. The defendants had, in fact, admitted their liability to make good certain defects on the premises which had arisen during their tenancy, and they had paid £40 into Court in respect of that which they pleaded was sufficient to satisfy all money claims of the plaintiff. In the year 1905 the house in question had been for some time unoccupied, and had been apparently left by the then owners in a considerable state of disrepair and neglect. The defendants desired to take the premises for a time for the purposes of their school, pending the acquisition of more suitable permanent premises, and accordingly an agreement was made on September 5, 1905, for three years. That agreement contained the usual repairing clause, and also provided that the lessee should expend not less than £300 upon alterations and repairs mentioned in plans signed by the architects of the lessees and lessor. He (the Referee) found on the evidence that that obligation was fully complied with, and although the then architect for the defendants said that they spent as little as possible, he (the Referee) did not understand him to mean that there was anything like scamping of the work. The premises were put into proper and efficient condition, and he further found upon the evidence given by those in occupation that the premises were, during the three years of the original agreement and during the two subsequent years of occupation, maintained in good condition and repair, and that they were in good condition and repair, subject only to such deterioration as might have been occasioned by reasonable wear and tear. At the end of the five years, or rather before the expiration of that period, the defendants desired to continue their tenancy, and they entered into a fresh agreement, which was made during the continuance of the tenancy and commenced on September 29, 1910. Under that agreement the new tenancy was for five years, subject to the power on the part of the defendants to determine at the end of three years. The defendants continued in occupation until 1912, when they determined to exercise their option. There was evidence that during the time they were in possession they had used the premises with care, and all the suggestions made by those who saw the house later, as to damp and the premises having been ill-used, fell to the ground. In 1912 the school ceased to occupy the premises, and until the expiration of the three years they were left unoccupied, except by caretakers. Mr. Leaver, the plaintiff, bought the premises three days before the termination of the tenancy, and he did not put them into a condition to be used as a school or private residence, but converted them into flats, and he was now bringing his action for damages in respect of dilapidation and for loss of occupation during the time they were under repair. He (the Referee) found that there had been no breach by the defendants, and, further, that plaintiff had not suffered damage beyond that which was covered by the amount paid into Court. There would be judgment for the defendants with costs, and the sum of £40 paid into Court would be ordered to be paid out to the plaintiff, who was not entitled to any payment in respect of loss of rent.

Judgment was entered accordingly.

Hadfield *v.* Marples.

IN reference to our report of this case, which appeared in our issue of October 24, 1914, Messrs. Horace Field & Michael Bunney inform us that the evidence reported to have been given by them at the trial in regard to the basis on which architects' charges should be made, in the case of alterations and additions to existing buildings, was incorrect. They say: "The view expressed by us was that, in this class of work, in certain cases 5 per cent. may be remunerative; but to report us as saying this is the customary charge in works costing more than £2,000 is incorrect and calculated to mislead."

PRICES CURRENT OF MATERIALS.

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.]

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.	£ s. d.
Best Stocks	1 18 0
Picked Stocks for Facings.....	2 12 0

Per 1000, Delivered at Railway Depôt.	£ s. d.		£ s. d.
Flettons	1 14 0	Best Blue Pressed Staffordshire.	3 15 0
Best Fareham Red	3 12 0	Do. Bullnose ..	4 0 0
Best Red Pressed Ruabon Facing	5 0 0	Best Stourbridge Fire Bricks ..	4 0 0
GLAZED BRICKS—			
Best White, Ivory, and Salt Glazed Stretchers ..	13 0 0	Double Headers	15 10 0
		One Side and two Ends....	19 10 0
Headers	12 10 0	Two Sides and one End	20 10 0
Quoins, Bullnose and 4½ in. Flats	16 10 0	Splays and Squints	18 0 0
D'ble Str'tch'rs	18 10 0		

Second Quality £1 10s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	7 6	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	38 0	per ton, ,,
Best Ground Blue Lias Lime	21 0	,, ,,

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 14s. 0d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube.

	s. d.
BATH STONE — delivered on road waggons, Paddington Depôt	1 7½
Do. do. delivered on road waggons, Nine Elms Depôt	1 9½
PORTLAND STONE (20 ft. average)—	
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 4½
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 6½

Per Ft. Cube, delivered at Railway Depôt.

	s. d.		s. d.
Ancaster in blocks..	1 10	Closeburn Red Beer in blocks	1 6
Greenshill in blocks	1 10	Red Mansfield Freestone	2 4
Darley Dale in blocks	2 4	Talacre & Gwespyr Stone	2 4
Red Corsehill in blocks	2 3		

STONE (*Continued*).

YORK STONE—*Robin Hood Quality.*

Per Ft. Cube, Delivered at Railway Depôt.	s.	d.
Scappled random blocks	2	10
Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto, ditto	2	6
3 in. sawn two sides slabs (random sizes)	0	11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7
1½ in. to 2 in. ditto, ditto	0	6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	3	0
Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landing to sizes under 40 ft. super.)	2	8
6 in. rubbed two sides ditto	3	0
8 in. sawn two sides slabs (random sizes)	1	2
2 in. self-faced random flags	0	5

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£	s.	d.	In. In.	£	s.	d.
20 x 10 best blue Bangor	13	5	6	20 x 12 ditto	14	5	0
20 x 12 ditto	14	7	6	16 x 8 ditto	7	0	0
20 x 10 1st q'lity ditto	13	0	0	22 x 10 best blue Portmadoc	12	12	6
				16 x 8 ditto	6	10	6

TILES.

At Railway Depôt.

	s.	d.		s.	d.
Best plain red roofing (per 1000)	42	0	Best "Hartshill" brand, plain sand-faced (per 1000)	45	0
Hip and Valley (per doz.)	3	7	Do. pressed (per 1000)	42	6
Best Broseley (per 1000)	50	0	Do. Ornamental (per 1000)	47	6
Do. Ornamental (per 1000)	52	6	Hip (per doz.)	4	0
Hip and Valley (per doz.)	4	0	Valley (perdoz)	3	6
Best Ruabon red, brown, or brindle (Edw'ds'(pr1000)	57	6	Staffords. (Hanley) Reds or Brindled (per 1000)	42	6
Do. Ornamental (per 1000)	60	0	Hand-madesand-faced (per1000)	45	0
Hip (per doz.)	4	0	Hip (per doz.)	4	0
Valley (per doz)	3	0	Valley (per doz)	3	6

WOOD.

BUILDING WOOD. At per standard.	£	s.	d.		£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	19	0	0	..	20	12	6
Deals: best 3 in. by 9 in.	19	0	0	..	20	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	17	15	0	..	19	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.			
Deals: seconds	1	0	0	less than best			
Battens: seconds	0	10	0	" "			
2 in. by 4 in. and 2 in. by 6 in.	16	0	0	..	17	10	0
2 in. by 4½ in. and 2 in. by 5 in.	15	0	0	..	16	10	0
Foreign Sawn Boards—							
1 in. and 1½ in. by 7 in.	0	10	0	more than battens.			
½ in.	1	0	0	"			
Fir timber: best middling	At per load of 50 ft.						
Memel (average specification)	6	15	0	..	7	15	0
Seconds	6	0	0	..	6	10	0
Small timber (8 in. to 10 in.)	5	5	0	..	5	10	0
Small timber (6 in. to 8 in.)	4	10	0	..	5	0	6
Swedish balks	4	0	0	..	4	10	0
Pitch-pine timber (30 ft. average)	8	5	0	..	9	0	0

JOINERS' WOOD. At per standard.							
White Sea: first yellow deals, 3 in. by 11 in.	33	15	0	..	35	0	0
3 in. by 9 in.	31	15	0	..	33	0	0
Battens, 2½ in. and 3 in. by 7 in.	23	7	6	..	24	7	6
Second yellow deals, 3 in. by 11 in.	27	5	0	..	28	5	0
Do. 3 in. by 9 in.	25	5	0	..	26	5	0
Battens, 2½ in. and 3 in. by 7 in.	19	0	0	..	20	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	20	2	6	..	21	2	6
Battens, 2½ in. and 3 in. by 7 in.	17	10	0	..	18	0	0
Petersburg: first yellow deals, 3 in. by 11 in.	29	10	0	..	31	0	0
Do. 3 in. by 9 in.	25	5	0	..	26	5	0
Battens	19	5	0	..	20	5	0
Second yellow deals, 3 in. by 11 in.	21	10	0	..	23	0	0
Do. 3 in. by 9 in.	20	5	0	..	21	10	0
Battens	17	10	0	..	18	10	0
Third yellow deals, 3 in. by 11 in.	17	15	0	..	18	15	0
Do. 3 in. by 9 in.	17	5	0	..	18	5	0
Battens	17	0	0	..	17	10	0
White Sea and Petersburg—							
First white deals, 3 in. by 11 in.	22	10	0	..	24	0	0
First white deals, 3 in. by 9 in.	21	0	0	..	22	10	0
Battens	18	0	0	..	19	0	0
Second white deals, 3 in. by 11 in.	20	0	0	..	21	0	0
Second white deals, 3 in. by 9 in.	19	0	0	..	20	0	0
Battens	17	10	0	..	18	10	0
Pitch-pine: deals	34	0	0	..	35	0	0
Under 2 in. thick extra	0	10	0	..	1	0	0
Columbian or Oregon Pine, best quality	28	0	0	..	29	0	0
Yellow Pine—First, regular sizes	57	0	0	upwards.			
Oddments	39	0	0	"			
Seconds, regular sizes	43	10	0	"			
Oddments	37	0	0	"			
Kauri Pine—Planks per ft. cube	0	6	9	..	0	7	6
Oak Logs—							
Large, per ft. cube	0	5	0	..	0	6	0
Small " "	0	4	0	..	0	5	0
Wainscot Oak Logs, per ft. cub	0	10	6	..	0	12	6

WOOD (*Continued*).

JOINERS' WOOD (*Continued*)—	£	s.	d.		£	s.	d.
Dry Wainscot Oak, per ft. super. as inch	0	0	11	..	0	1	3
¼ in. do. do.	0	0	10	..	0	1	0
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	11	..	0	1	4
Selected, Figury, per ft. super. as inch	0	1	6	..	0	2	6
Cuba Mahogany	0	1	6	..	0	2	6
Dry Walnut, American, per ft. super., as inch	0	0	11	..	upwards. 0	1	3
French, "Italian," Walnut	0	0	11	..	0	1	6
Teak, per load (Rangoon or Moulmein)	28	0	0	..	34	0	0
Do., do. (Java)	24	0	0	..	27	0	0
American Whitewood planks, per ft. cube	0	6	6	..	0	7	6
Prepared Flooring, etc.—	Per square.						
1 in. by 7 in. yellow, planed and shot	0	18	0	..	1	0	0
1 in. by 7 in. yellow, planed and matched	0	18	0	..	1	0	0
1¼ in. by 7 in. yellow, planed and matched	1	2	0	..	1	5	0
1 in. by 7 in. white, planed and shot	0	17	6	..	1	0	0
1 in. by 7 in. white, planed and matched	0	18	0	..	1	0	0
1¼ in. by 7 in. white, planed and matched	1	2	0	..	1	5	0
¾ in. by 7 in. yellow, matched and beaded or V-jointed boards	0	14	6	..	0	16	6
1 in. by 7 in. " "	0	18	6	..	1	1	0
¾ in. by 7 in. white " "	0	14	6	..	0	16	6
1 in. by 7 in. " "	0	18	6	..	1	1	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	9	10	0	..	10	10	0
Compound Girders, ordinary sections	12	0	0	..	13	0	0
Steel Compound Stanchions	13	0	0	..	15	0	0
Angles, Tees, and Channels, ordinary sections	12	0	0	..	13	0	0
Flitch Plates	12	0	0	..	13	0	0
Cast Iron Columns & Stanchions, including ordinary patterns	9	0	0	..	10	0	0

METALS.

	Per ton, in London. £	s.	d.		£	s.	d.
IRON—							
Common Bars	9	10	0	..	10	0	0
Staffordshire Crown Bars, good merchant quality	9	15	0	..	10	5	0
Staffordshire "Marked Bars"	11	10	0	..	—		
Mild Steel Bars	9	15	0	..	10	5	0
Hoop Iron, basis price	10	10	0	..	—		
" Galvanised	18	10	0	..	—		
(And upwards, according to size and gauge.)							
Sheet Iron Black—							
Ordinary sizes to 20 g.	11	0	0	..	—		
" " 24 g.	12	0	0	..	—		
" " 26 g.	13	10	0	..	—		
Sheet Iron, Galvanised, flat, ordinary quality—							
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16	0	0	..	—		
Ordinary sizes to 22 g. and 24 g.	16	10	0	..	—		
Ordinary sizes to 26 g.	17	10	0	..	—		
Sheet Iron, Galvanised, flat, best quality—							
Ordinary sizes to 20 g.	18	10	0	..	—		
" " 22 g. and 24 g.	19	0	0	..	—		
Ordinary sizes to 26 g.	20	0	0	..	—		
Galvanised Corrugated Sheets—							
Ordinary sizes, 6 ft. to 8 ft. 20 g.	15	0	0	..	—		
Ordinary sizes, 22 g. and 24 g.	16	0	0	..	—		
Ordinary sizes, 26 g.	17	0	0	..	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	13	0	0	..	—		
Best Soft Steel Sheets, 22 g. & 24 g.	14	0	0	..	—		
Best Soft Steel Sheets, 26 g.	16	0	0	..	—		
Cut Nails, 3 in. to 6 in.	13	0	0	..	13	10	0
(Under 3 in., usual trade extras.)							

LEAD, &c.

	Delivered in London. £	s.	d.		£	s.	d.
LEAD—Sheet, English, 4 lb. and up	23	12	6	..	—		
Pipe in coils	24	2	6	..	—		
Soil pipe	27	2	6	..	—		
Compo pipe	27	2	6	..	—		
NOTE—Delivery in country in not less than 5 cwt. lots, 1s. per cwt. extra.							
ZINC—	In casks of 10 cwt.						
Sheet—	65	0	0	..	—		
COPPER—							
Strong Sheet per lb.	0	1	5	..	—		
Thin "	0	1	7	..	—		
Copper nails "	0	1	5	..	—		
Copper wire "	0	1	5	..	—		
BRASS—							
Strong Sheet "	0	1	4	..	—		
Thin "	0	1	5	..	—		
TIN—English Ingots "	0	1	8	..	—		
SOLDER—Plumbers' "	0	0	10	..	—		
Tinmen's "	0	1	1	..	—		
Blowpipe "	0	1	4	..	—		

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.*

Per Ft. Delivered.

15 oz. thirds	6d.	26 oz. fourths	6½d.
" fourths	5½d.	32 oz. thirds	8½d.
21 oz. thirds	6½d.	" fourths	7d.
" fourths	6d.	Fluted Sheet, 15 oz.	5d.
26 oz. thirds	7d.	" 21 oz.	6d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.*

Per Ft. Delivered.

¼ Rolled plate	3½d.
⅜ Rough rolled and rough cast plate	3½d.
½ Rough rolled and rough cast plate	4d.
Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	5d.
Ditto, tinted	6d.

* Not less than two crates.

OILS, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	6
" " " in barrels	"	0	2	7
" " " in drums	"	0	2	9
Boiled " " in barrels	"	0	2	9
" " " in drums	"	0	2	11
Turpentine in barrels	"	0	3	3
" in drums	"	0	3	6
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)		30	15	0
Red Lead, Dry	per ton	29	10	0
Best Linseed Oil Putty	per cwt.	0	10	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	6
Fine Elastic Carriage	0	12	9
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	10	0
Finest Pale Durable Copal	0	18	6
Extra Pale French Oil	1	1	0
Eggshell Flating Varnish	0	18	0
White Pale Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	0
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	0
Berlin Black	0	16	0
Knotting	0	10	6
French and Brush Polish	0	10	0

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.]

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 2 *p.m. on Wednesday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases and for special reasons.]

*Denotes *accepted.* †Denotes *provisionally accepted.*

ASHTON-UNDER-LYNE.—For erection of Mossley-road Council School, to accommodate 600 children, for the Ashton-under-Lyne Education Committee. Quantities by Messrs. Eaton, Son, & Cantrell, Architects, Stamford-street, Ashton-under-Lyne:—

M. Warrington	£10,400	I. Ridyard & Sons, Ltd.	£9,936
J. Green	1,355	J. Mann, Ltd.	9,898
F. Woolley	10,269	Swallow & Taylor	9,895
J. Gibson & Sons	10,171	Fitton & Bowness	9,845
Shuttleworth Bros.	10,165	E. Marshall & Sons, Ltd., Ashton-under-Lyne*	9,497
T. Dean & Co., Ltd.	10,132		

BROADSTAIRS.—For erection of the proposed town depôt of buildings, cart-sheds, cottage, fencing, etc. Mr. H. Hurd, Surveyor, Council Offices, Broadstairs:—

Town Depôt.

Saunders & Co.	£2,3-9 10	J. E. White	£1,660 0
Godden & Son	2,087 0	Dagley Bros.	1,634 0
E. W. Martin	1,940 0	Attwood & Co.	1,625 0
C. E. Culver	1,798 0	H. Cro	1,558 9
C. B. Philpott	1,719 0		

[Surveyor's estimate, £1,755 9s. 9d.]

Weighbridge.

H. Pooley & Sons	£86 0	W. Hodson & Sons	£79 0
Chayney & Co.	84 10	Avery & Co.	74 10
Ashworth, Sons, & Co.	78 0		

[Surveyor's estimate, £80.]

BRIGG.—Erection of twelve workmen's cottages in South Killingholme, and twelve in Goxhill, for the Brigg Rural District Council:—

Gilbert & Hall, Nottingham* ... £2,075 each lot.

CHESTERFIELD.—The Chesterfield and Tapton Burial Acts Joint Committee have accepted the following tenders for laying out the Boythorpe Burial Ground:—

Erection of Buildings, Fence, etc.

Marsden Bros.* £3,398 0 0

Road-making, Drains, and Water Supply.

W. W. Bateman* £2,257 13 7

CRAVEN ARMS.—Two cottages for Miss A. M. Biggs. Mr. John Butters, M.S.A., architect, Ludlow:—

J. Bowdler	£793	Turford & Southward	£659
J. H. Davis	798	Watkins & Son, Leominster*	625
G. H. Brown	750		

CRAVEN ARMS.—For new oak choir stalls, etc., at Stokesay Church, for Mrs. H. J. Allcroft. Mr. John Butters, M.S.A., Architect, Ludlow:—

Turford & Southward, Ludlow* ..... £11)

FERRYHILL.—For erection of house, shop, stable, etc., at Ferryhill Village, for Mr. J. H. Forster. Mr. H. Moore, architect, Bishop Auckland and Shildon Quantities by Mr. H. Moore, architect, 39, Newgate-street, Bishop Auckland:—

W. Hudson	£1,193 13 8	Blackett	£910 0 0
Todd & Son	940 8 6	Chapman	806 6 0
T. Manners	929 10 0	Wells	827 18 7
Sowerby	928 6 3	Robson & Gargett	808 11 9

[The job is stopped owing to the war.]

IPSWICH.—The Corporation have accepted the following tenders for the enlargement of the refuse destructor:—

For Destructor Cells, Boiler, Flue Connections, etc.
Heenan & Frowde £3,137

For Enlargement of the Destructor.
E. Catchpool & Sons, Ltd. 1,630

For Electric Crane.
Royce, Ltd. 185

IPSWICH.—For steel bunkers, elevator, conveyor, etc., at generating station, for the Corporation:—
Fraser & Chalmers, Erith* £2,320 10

IRONBRIDGE (Salop).—For erection of drill hall and stores, for the Shropshire Territorial Association. Mr. John Butters, M.S.A., architect, Ludlow:—

Treasure & Son, Ltd.	£2,495	E. H. Nicholas	£1,868
Thomas & Sons, Ltd.	2,160	T. E. Lay	1,795
A. Pearce	1,945	Vaughan & Son, Hereford*	1,766
A. Roper	1,870		

LONDON.—Rebuilding of Winchester-street School, Finsbury, for the London County Council:—

J. Chessum & Son	£12,752	A. Monk	£10,170
Rowley Bros.	11,220	J. Willmott & Sons	10,117
W. Lawrence & Son	10,972	McCormick & Sons, Ltd.	10,043
Perry & Co. (Bow), Ltd.	10,929	C. P. Roberts & Co., Ltd.	9,986
L. H. & R. Roberts	10,928	W. F. Blay, Ltd.	9,970
Brand, Pettit, & Co.	10,312	A. Fairhead & Son, Enfield*	9,737
Patman & Fotheringham, Ltd.	10,271		
W. J. Maddison	10,171		

[Architect's estimate, £10,127.]

LONDON.—Enlargement of Haverstock-Hill School, St. Pancras, for the London County Council:—

General Building Co.	£3,539	0	0
J. Chessum & Son	3,350	0	0
G. Neal	3,133	0	0
A. Monk	3,046	0	0
McCormick & Sons, Ltd.	2,982	11	2
Brand, Pettit, & Co.	2,839	0	0
Lole & Co.	2,807	13	0
C. Wall, Ltd.	2,765	0	0
A. Roberts & Co., Ltd.	2,765	0	0
C. W. Bovis & Co., Ltd.	2,760	0	0
A. Fairhead & Son, Enfield*	2,681	0	0

LONDON.—Enclosing land, etc., at Holmes-road School, St. Pancras, for the London County Council:—

General Building Co.	£1,497	0	0
F. Pitcher	1,066	19	6
A. Monk	925	0	0
E. A. Roome & Co.	915	0	0
Bovis, Ltd.	887	0	0
G. Godson & Sons	885	0	0
W. F. Blay, Ltd.	847	0	0
Triggs & Co.	837	0	0
McCormick & Sons, Ltd.	830	0	0
Brand, Pettit, & Co.	795	0	0
H. & E. Lea	793	0	0
F. Bull	791	0	0
Marchant, Hirst, & Co.	776	0	0
Stevens & Sons, 67, Crouch-hill*	748	0	0

LONDON.—Adaptation of Barrett-street (Marylebone) Elementary School as trade school for girls, for the London County Council:—

General Building Co.	£1,117	J. C. Mather	£850
J. B. Sims	915	Triggs & Co.	849
G. Godson & Sons	903	A. J. Staines & Co., Ltd.	844
Bovis, Ltd.	897	Lole & Co.	832
A. Roberts & Co., Ltd.	860	J. & C. Bowyer, Ltd., Upper Norwood*	815
Markham & Markham	858		

LONDON.—For the London County Council Education Committee:—

Islington, S.—Sebbon-street—Heating.

J. C. Christie	£985	0	0
T. W. Vaughan & Co., Ltd.	918	0	0
Brightside Foundry and Engineering Co., Ltd.	865	0	0
W. G. Cannon & Sons, Ltd.	860	0	0
J. Biggs	858	0	0
Cannon & Hefford	839	10	0
W. Truswell & Son	837	0	0
W. Freer	824	0	0
H. J. Cash & Co., Ltd.	818	0	0
F. Davies	815	0	0
Palowkar & Sons	814	0	0
G. & E. Bradley	800	0	0
J. & F. May	796	0	0
Yetton & Brockett, Ltd., Munton Works, Munton-road*	787	0	0

[Architect's estimate, £825.]

St. Pancras, S.—Exmouth-street—Electric Lighting.

Honor Bros.	£660	0	0
Lund Bros. & Co.	414	0	0
T. H. Smerdon	412	0	0
G. Weston & Sons, Ltd.	410	3	6
R. H. & J. Pearson, Ltd.	398	18	6
Johnson, O'Sullivan, & Co.	365	0	0
Alpha Manufacturing Co.	364	16	0
A. Hawkins & Sons	335	0	0
H. J. Cash & Co., Ltd., Caxton House, Westminster*	349	0	0

[Chief Engineer's estimate, £445.]

Wandsworth—Wandsworth Technical Institute—Painting New One-Story Building.

W. Read	£246	11	6
F. Bull	232	10	0
R. A. Jewell	220	0	0
Maxwell Bros., Ltd.	207	0	0
J. Garratt & Son	204	0	0
G. W. Clarke	199	0	0
Lole & Co.	185	4	3
Triggs & Co., 92, The Chase, Clapham*	155	0	0
H. Line	154	0	0

[Architect's estimate, £185.]

LOUTH.—Purchase of steam roller, by the Corporation:—
Ruston & Proctor* £537 1

LUDLOW.—For oak panelling for Masonic Temple. Mr. John Butters, M.S.A., Architect, Ludlow:—
Turford & Southward, Ludlow* £108

LUDLOW.—Erection of twenty-two cottages at Ludlow, Salop, for the Borough Council. Mr. John Butters, M.S.A., Architect, Ludlow:—

J. Bowdler	£5,334	0	0
J. H. Davis	5,330	0	0
J. Watkins & Son	5,244	12	6
G. Field	4,668	0	0
Turford & Southward, Ludlow†	4,611	1	0
H. Field	4,339	0	0

MALDON.—For erection of a recreation ground, keeper's lodge and ladies' lavatory, also a gentleman's convenience, on the public recreation ground. Mr. T. R. Swales, Borough Engineer and Surveyor, Maldon, Essex:—

F. Sherling	£793	0	A. Smith £610 19
R. J. Woodyard	785	0	Spalding Sons & Co., Norwich* 600 0
H. Potter	700	0	
S. Rayner	675	10	

SHEFFIELD.—For widening of High Bridge, Penistone-road, for the Sheffield City Council. Mr. Charles F. Wike, City Engineer, Sheffield. Quantities by Surveyor:—
T. Wilkinson & Son, Guernsey-road, Hesley, Sheffield* £2,995

SWADLINCOTE.—Accepted tender for building shopping premises in High-street, Swadlincote, for Mr. James Woodward. Mr. Gordon Allen, A.R.I.B.A., architect, 13, Holmdale-road, West Hampstead, N.W.:—
Edwin Clark, Woodville* £1,026

TORRINGTON.—For removal of cottage buildings in Well-street, and erection of five dwelling houses, etc., for the Corporation. Mr. W. C. Medland, Borough Surveyor, Great Torrington, Devon. Quantities not supplied:—

F. Cann	£1,250 0 0
T. Bowden	1,098 16 0
A. Darch, The Mills, Torrington*	1,027 19 9

WEST HAM.—Extension of the Asylum, for the Visiting Committee:—
F. J. Coxhead* £53,961
(Plus 2½ per cent. to cover any increased cost of building material and labour.)

WINDSOR.—Erection of Albert Bridge, for the County Councils of Berks and Bucks:—
Mussellwhite & Son* £8,880

YEOVIL.—For making-up Roseberry-avenue, for the Corporation:—
R. Bicknell* £578 4 7

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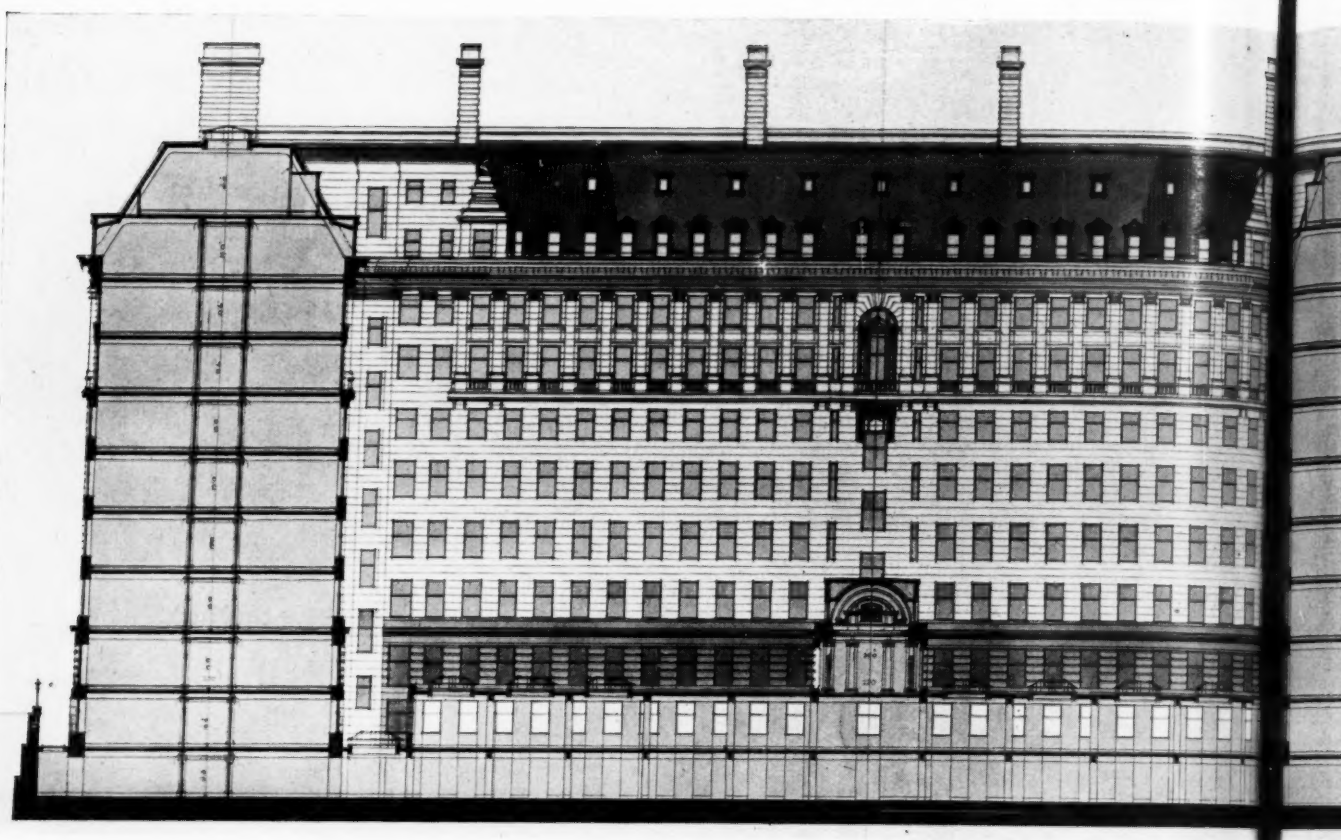
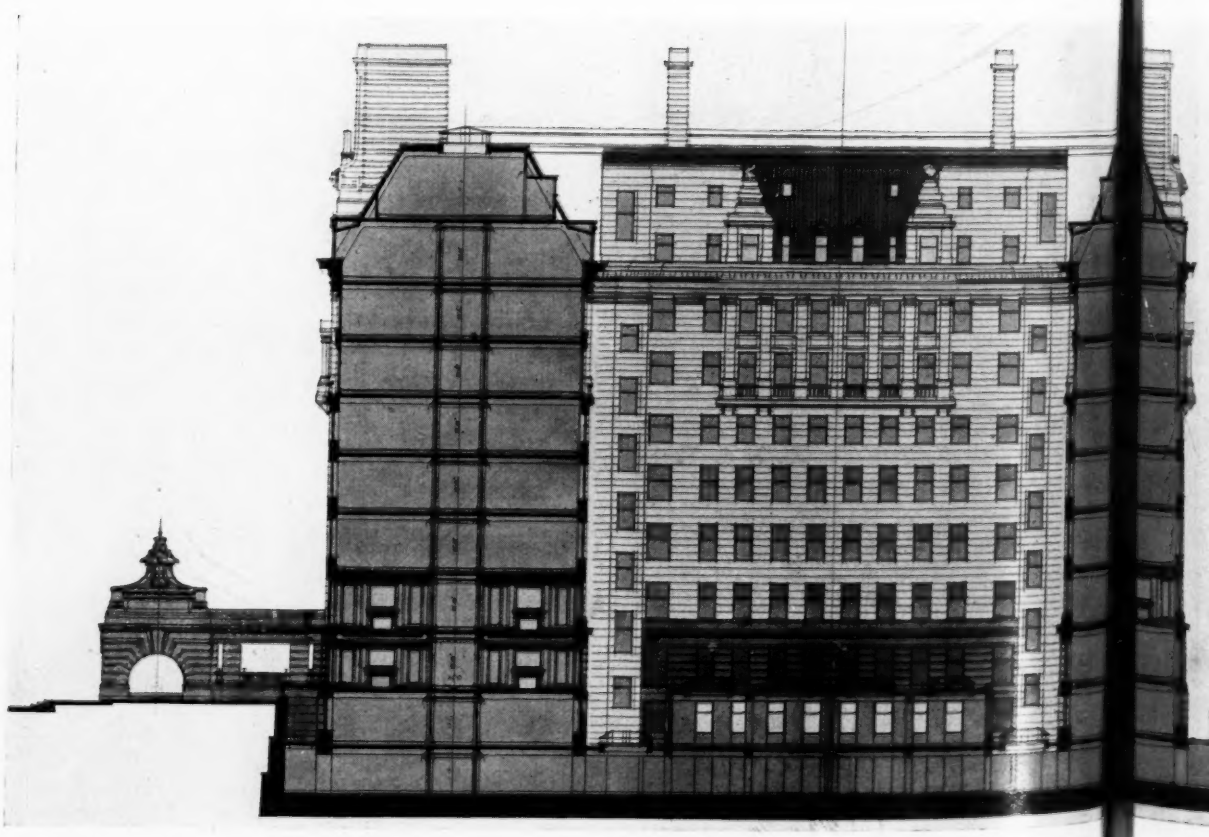


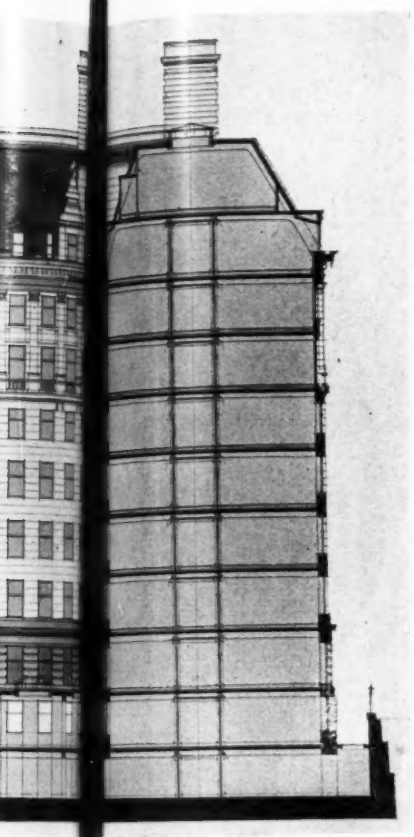
Longitudinal Section.

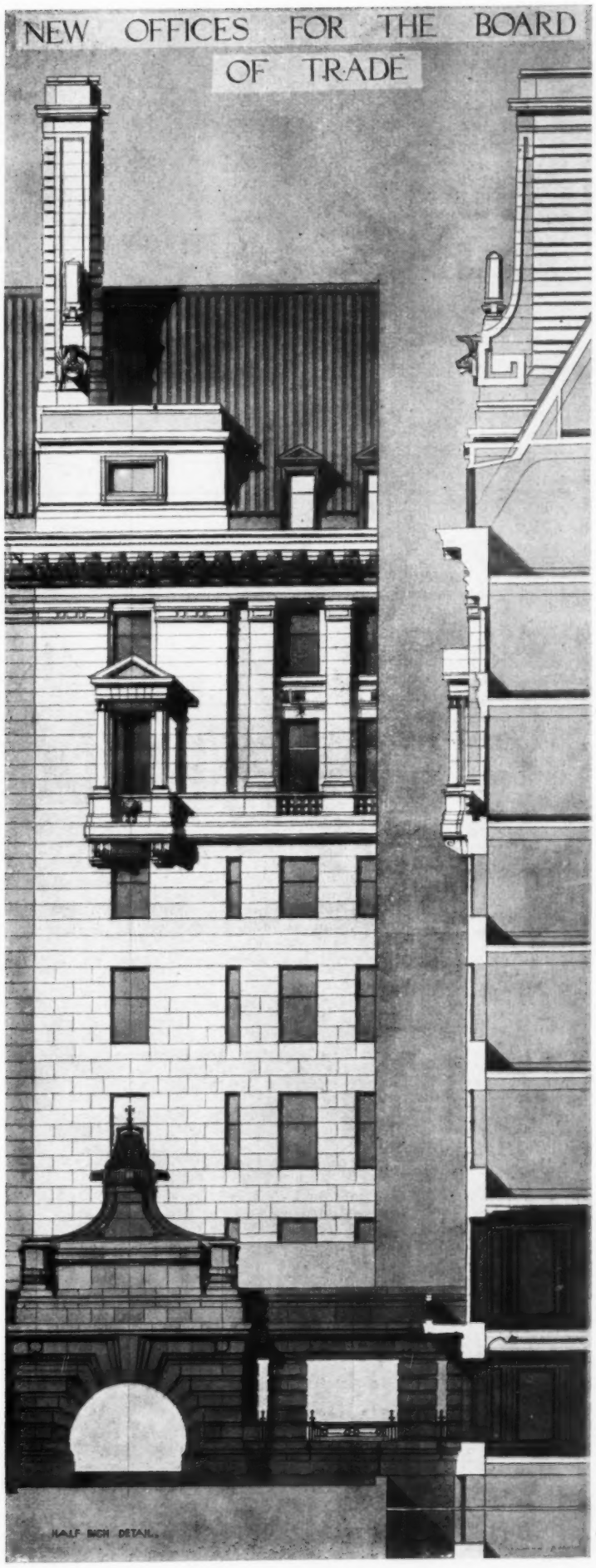


Cross-Section.

N 18 J

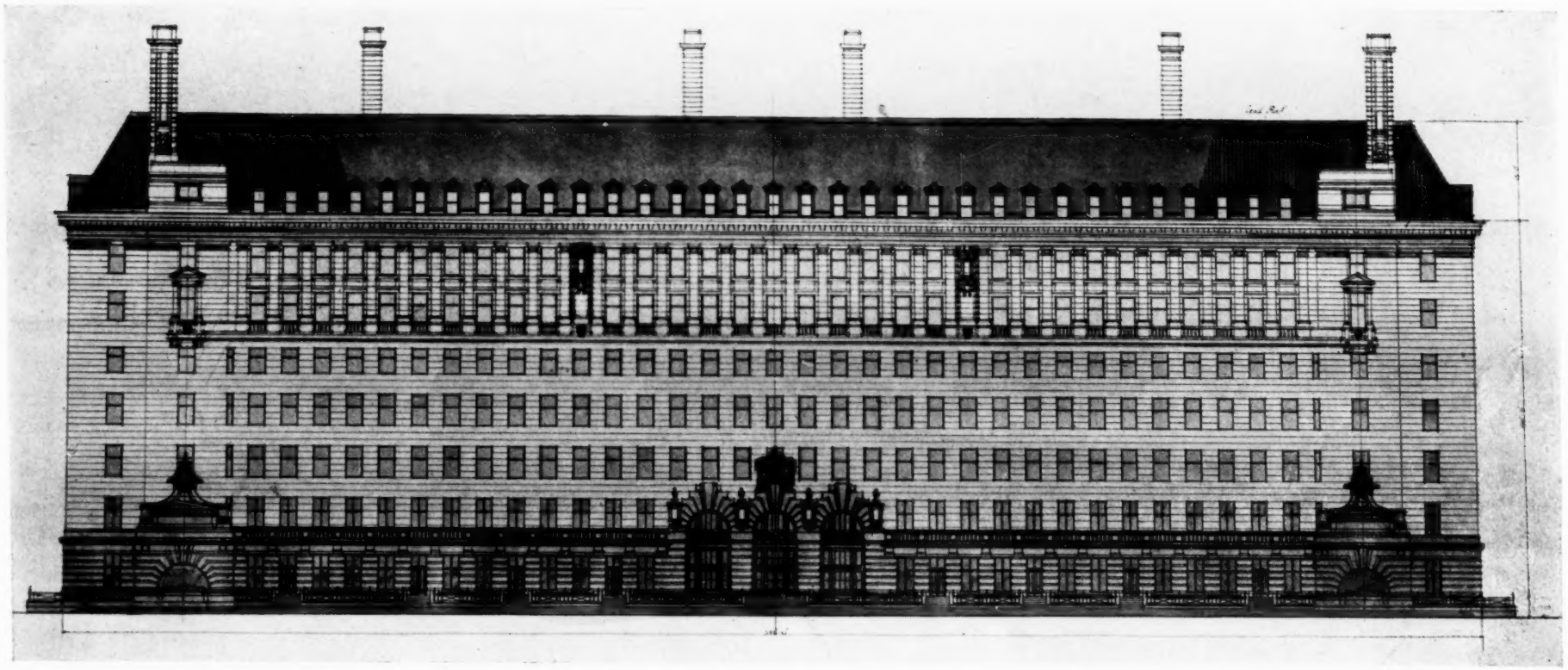
BOARD OF TRADE OFFICES: FINAL COMPE[illegible]ELECTED

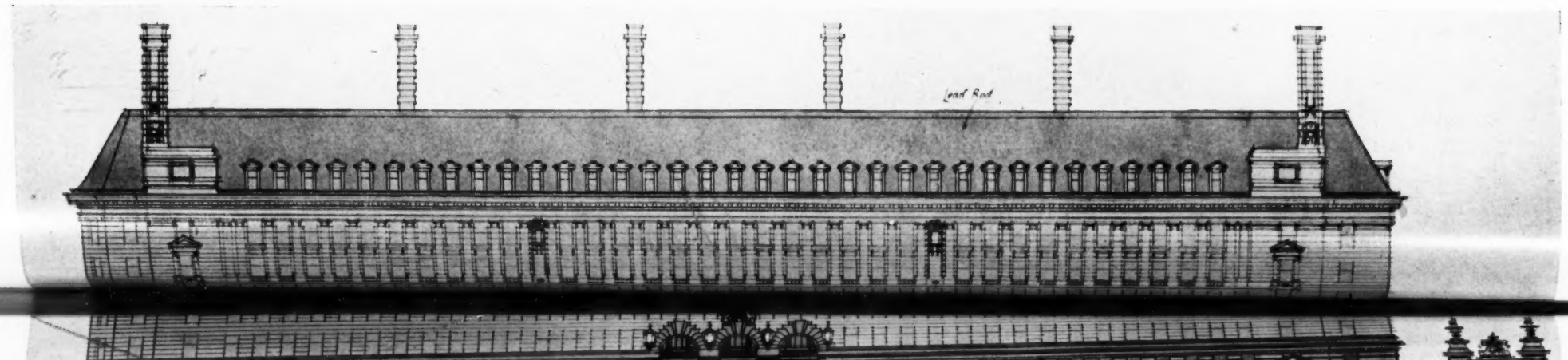


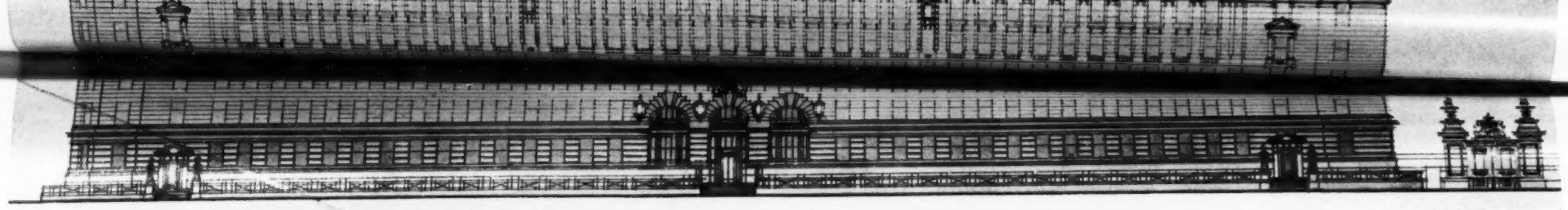


DETAIL.

COMPE[illegible]ELECTED DESIGN, BY MR. E. VINCENT HARRIS, F.R.I.B.A.

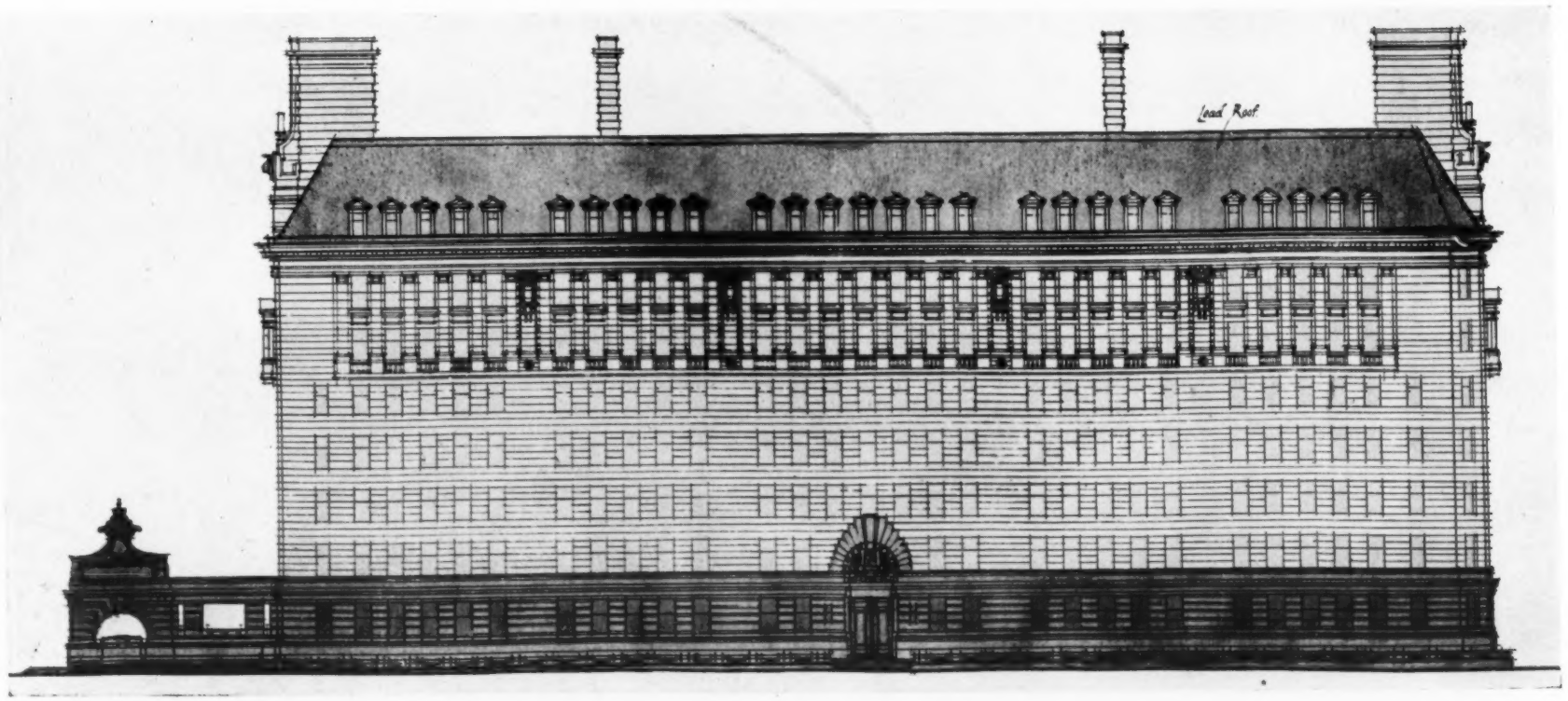



Lead Roof



WHITEHALL GARDENS FRONT.

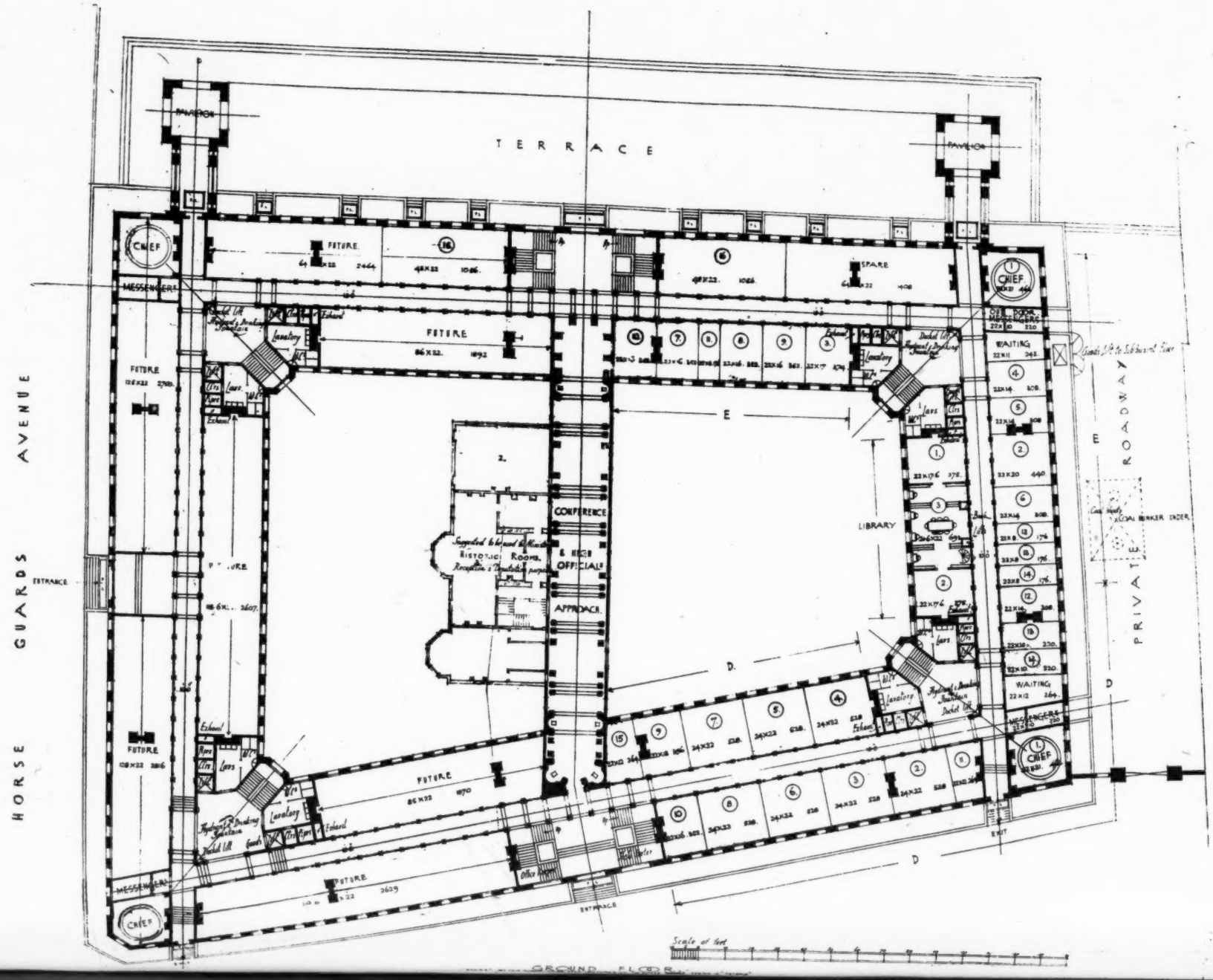
Scale of feet



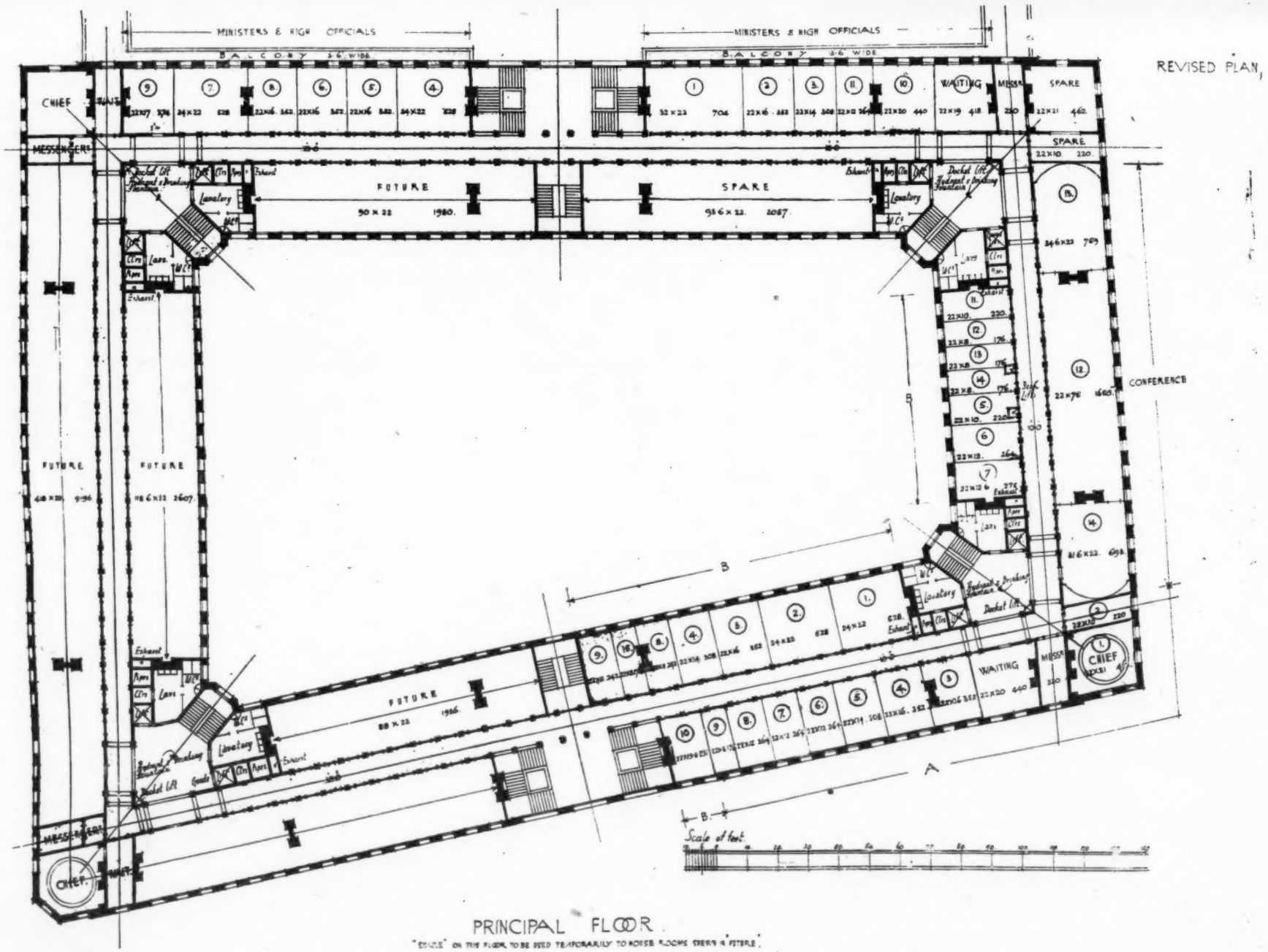
HORSEGUARDS AVENUE FRONT.

Scale of feet

BOARD OF TRADE OFFICES: FINAL COMPETITION.—Selected Design, by Mr. E. Vincent Harris, F.R.I.B.A.


TERRACE
PAVILION
PAVILION
CHIEF
MESSENGERS
FUTURE
FUTURE
FUTURE
SPARE
CHIEF
CHIEF
WAITING
WAITING
MESSENGERS
CONFERENCE
& HIGH OFFICIALS
APPROACH
LIBRARY
Historical Rooms
Laboratory
Lavs
Lifts
Enlarged
FUTURE
FUTURE
FUTURE
FUTURE
MESSENGERS
CHIEF
ENTRANCE
EXIT
HORSE GUARDS AVENUE
ROADWAY
PRIVATE
E
D
Scale of Feet
GROUND FLOOR

MINISTERS & HIGH OFFICIALS
MINISTERS & HIGH OFFICIALS

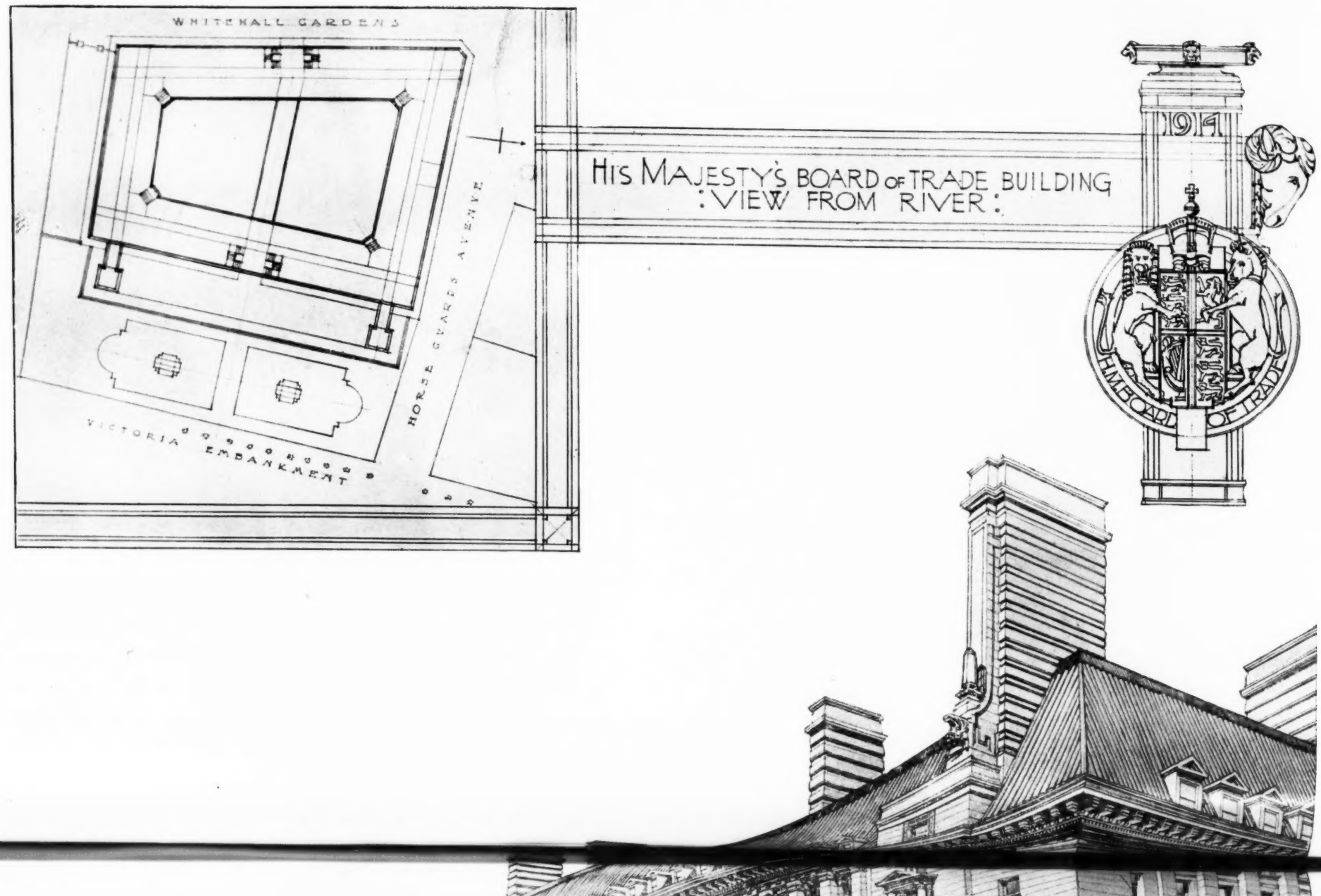


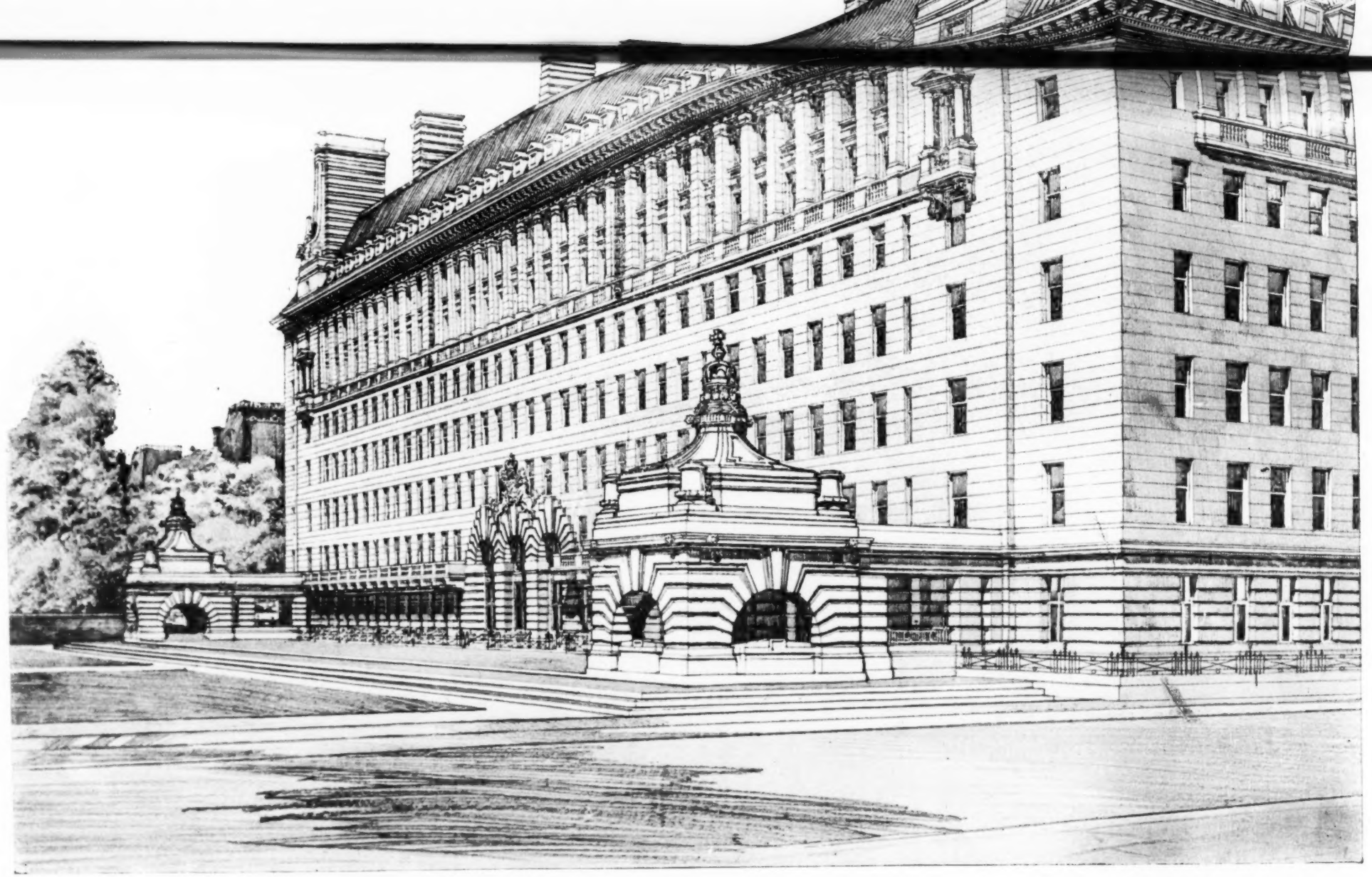
REVISED PLAN.

PRINCIPAL FLOOR.

"SPARE" ON THIS FLOOR, TO BE USED TEMPORARILY TO HOUSE ROOMS SHOWN AS "FUTURE".

BOARD OF TRADE OFFICES: FINAL COMPETITION.—SELECTED DESIGN, BY MR. E. VINCENT HARRIS, F.R.I.B.A.


WHITEHALL GARDENS
HORSE GUARDS AVENUE
VICTORIA EMBANKMENT
HIS MAJESTY'S BOARD OF TRADE BUILDING
: VIEW FROM RIVER :
1914
H.M. BOARD OF TRADE



BOARD OF TRADE OFFICES: FINAL COMPETITION.—Selected Design, by Mr. E. Vincent Harris, F.R.I.B.A.